GAS

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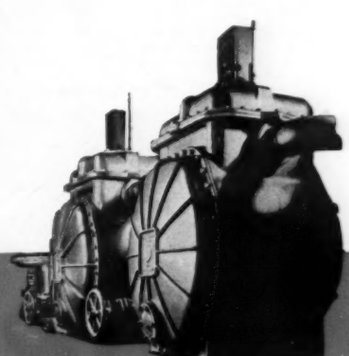
Low cost of meter ownership . . . as measured by meter performance records . . . consistently justifies owners' claim that AMERICAN meter use calls for lowest possible meter investment over the entire period of service.



GENERAL OFFICES • 60 EAST 42ND STREET, NEW YORK, N. Y.

AMERICAN METER COMPANY

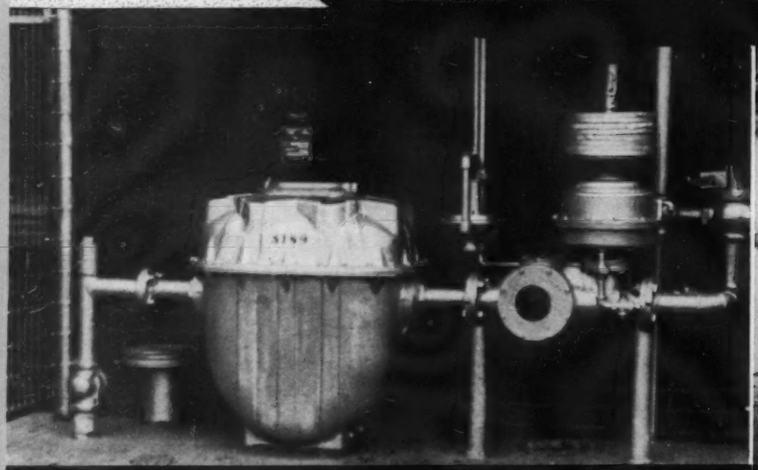
INCORPORATED (ESTABLISHED 1836)

1505

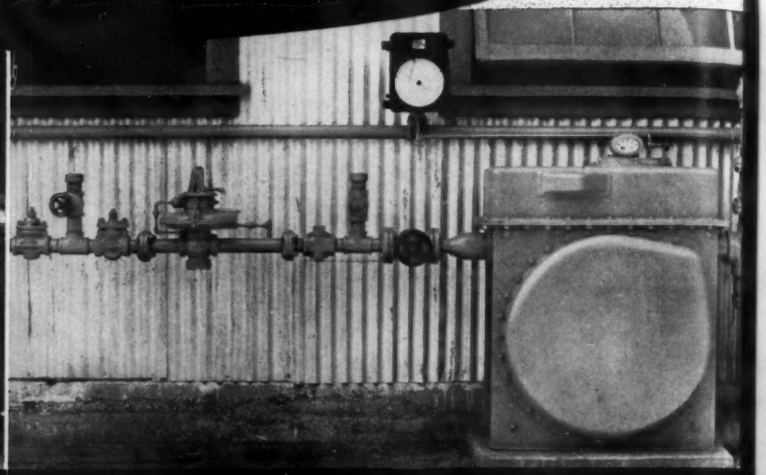
SEPTEMBER 1940 ◆ ◆ 25 CENTS

Precision Measurement and Control for Industrial Gas Loads

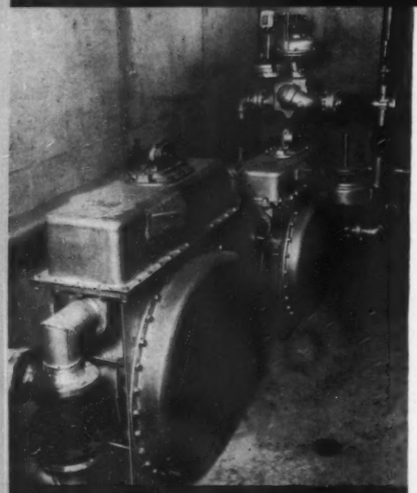
EMCO METERS AND REGULATORS
NORDSTROM LUBRICATED PLUG VALVES



Industrial Gas Metering and Regulating Installation Using EMCO Low Pressure Balanced Valve Regulator, EMCO No. 4 Meter equipped with EMCORECTOR, and NORDSTROM Valves.



EMCO "1001" Regulator and NORDSTROM Valves on Industrial Line with EMCO Pressed Steel Meter.



Two-stage EMCO Pressure Regulation and EMCO Pressed Steel Meters in California Industrial Plant. Lines are NORDSTROM Valve Controlled.

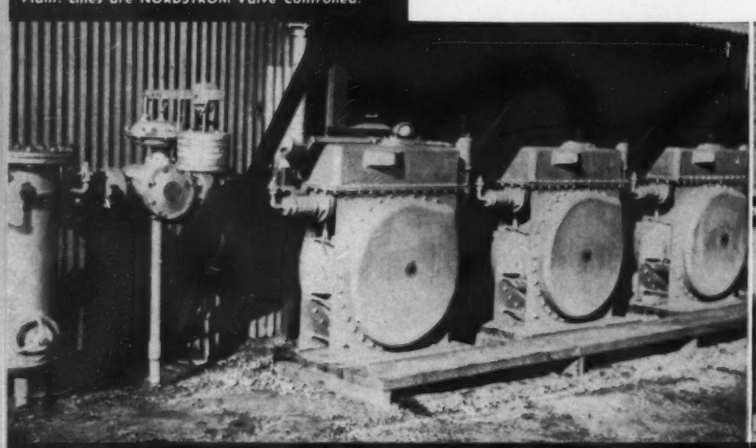
OF industry's three most widely used types of fuel —gas, coal and oil—gas alone offers unique savings in addition to its inherent operating advantages and efficiencies.

The efficient utilization of this simple, easy method of fuel supply is dependent upon metering and control equipment developed for this service itself. EMCO Meters and Regulators provide the necessary accuracy, ruggedness and simplicity. They have progressed hand in hand with the growth of industrial gas consumption.

PITTSBURGH EQUITABLE METER COMPANY
MERCO NORDSTROM VALVE CO.

NEW YORK · BUFFALO · PHILADELPHIA
KANSAS CITY · TULSA · LOS ANGELES
Main Offices · PITTSBURGH, PA.
DES MOINES · CHICAGO · COLUMBIA
MEMPHIS · OAKLAND · HOUSTON

Midwest Manufacturing Plant Utilizing EMCO Large Capacity Meter with EMCO Low Pressure Balanced Valve Regulator and NORDSTROM Valves.



Three EMCO Pressed Steel Meters and an EMCO High Pressure Balanced Valve Regulator Accurately Measuring and Controlling over 7,000,000 Cubic Feet of Gas per Month in a Felt Manufacturing Plant.

EMCO No. 4 Large Capacity Meter with Combined Record Gauge Measuring Gas Controlled by EMCO Low Pressure Balanced Valve Regulator and NORDSTROM Valves.

VALUE *Can't Always be Seen*

AUTOMATIC CONTROLS MH

The new L147 Summer-Winter Controller combines, in one instrument, a low limit control and relay for water circulator. The compact relay unit, indicated above, makes this new instrument a masterpiece of engineering design.

Into every Minneapolis-Honeywell product is built the results of more than 50 years of control experience and thousands of laboratory and field tests. This engineering, design and precision manufacturing represents value that cannot be seen, but it insures the accuracy and dependability of every Minneapolis-Honeywell control. It will back up your promise of care-free, uninterrupted operation and is good insurance on every job.

MINNEAPOLIS-HONEYWELL

Minneapolis-Honeywell Regulator Company, 2946 Fourth Ave. S., Minneapolis, Minn. Canadian Plant: Toronto, Ontario. European Plant: London, England. Company owned branches in 49 other cities.

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GAS

REG. U. S. PATENT OFFICE

Sixteenth Year of Publication

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Publication Office: **LOS ANGELES, 1709 West Eighth Street. DRexel 4337.** ***Branches:*** **NEW YORK, 381 Fourth Avenue, MUrray Hill 4-0698. DALLAS, 3645 Haynie Ave., Phone 58-1764. CHICAGO, 1064 Peoples Gas Building, HARrison 6634.**

September, 1940. Volume XVI, Number 9. *GAS* is published monthly by Western Business Papers, Inc., at 1709 West Eighth Street, Los Angeles, California. **JAY JENKINS,** President and General Manager; **CRAIG ESPY,** Vice President; **JAMES E. JENKINS,** Secretary-Treasurer; **ARTHUR ROHMAN,** Managing Editor; **ELLIOTT TAYLOR,** Eastern Editor; **W. G. RUSSELL,** Field Representative. Subscription price: United States, Mexico and Central American countries (in advance), 25 cents the copy; three years for $2.00, $1.00 per year; all other countries, $3.00 per year. Entered as second class matter August 20, 1936, at the post office at Los Angeles, Calif., under the Act of March 3, 1879. Copyright, 1940.

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To Get the PIPE in the Ground . . .
Use "CLEVELANDS" and *Watch Your Costs Go Down!*

For All-round Gas Trenching-
the MODEL 95

The Famous "Baby Digger" pioneered and perfected by "Cleveland" known and used every day by Gas Companies the country over.

Answers every requirement for distribution work. An unbeatable combination of speed, maneuverability, power and ditch-capacity, in a small mobile unit. Digs 11" to 23" in width. 5½' in depth.

for { **1. Laying Pipe**
2. Filling and Compacting Trenches

the MODEL 80

The "80" applies machine-savings to the pipelaying and backfilling operations. Speeds up the work, does a 100% job of trench-compacting at much lower costs. Works in limited spaces.

A machine of such genuine utility, you'll wonder how you ever got along without it.

and NOW!

A STILL SMALLER TRENCHER FOR SERVICE AND SMALL DIAMETER PIPE . . . the MODEL 75

The latest "Cleveland" achievement, the "75" weighs but 7000 pounds! Is only 45 inches wide! Digs 8 to 12 inches width, 3½ feet depth.
At last! A tiny trencher, for small trench, that has the required strength and durability.

Ask for Information TODAY on These Modern Machines

THE CLEVELAND TRENCHER COMPANY
"Pioneer of the Small Trencher"
20100 St. Clair Ave. Cleveland, Ohio

CLEVELANDS

MEN AT WORK constructing a cast iron line are building for the ages. Generations yet unborn will benefit from their labors and the long life of cast iron pipe. In recent years, both laying methods and pipe manufacturing processes have been materially improved. The service to be counted on from properly laid U. S. pit cast pipe or U. S. Super-de Lavaud *chill-free* centrifugally cast pipe is greater than ever.

U.S. cast iron PIPE

Centrifugally or pit cast—for water works, gas, sewerage, drainage and industrial service.

U. S. PIPE & FOUNDRY CO.

General Offices: Burlington, N. J.

Foundries and Sales Offices throughout the U. S.

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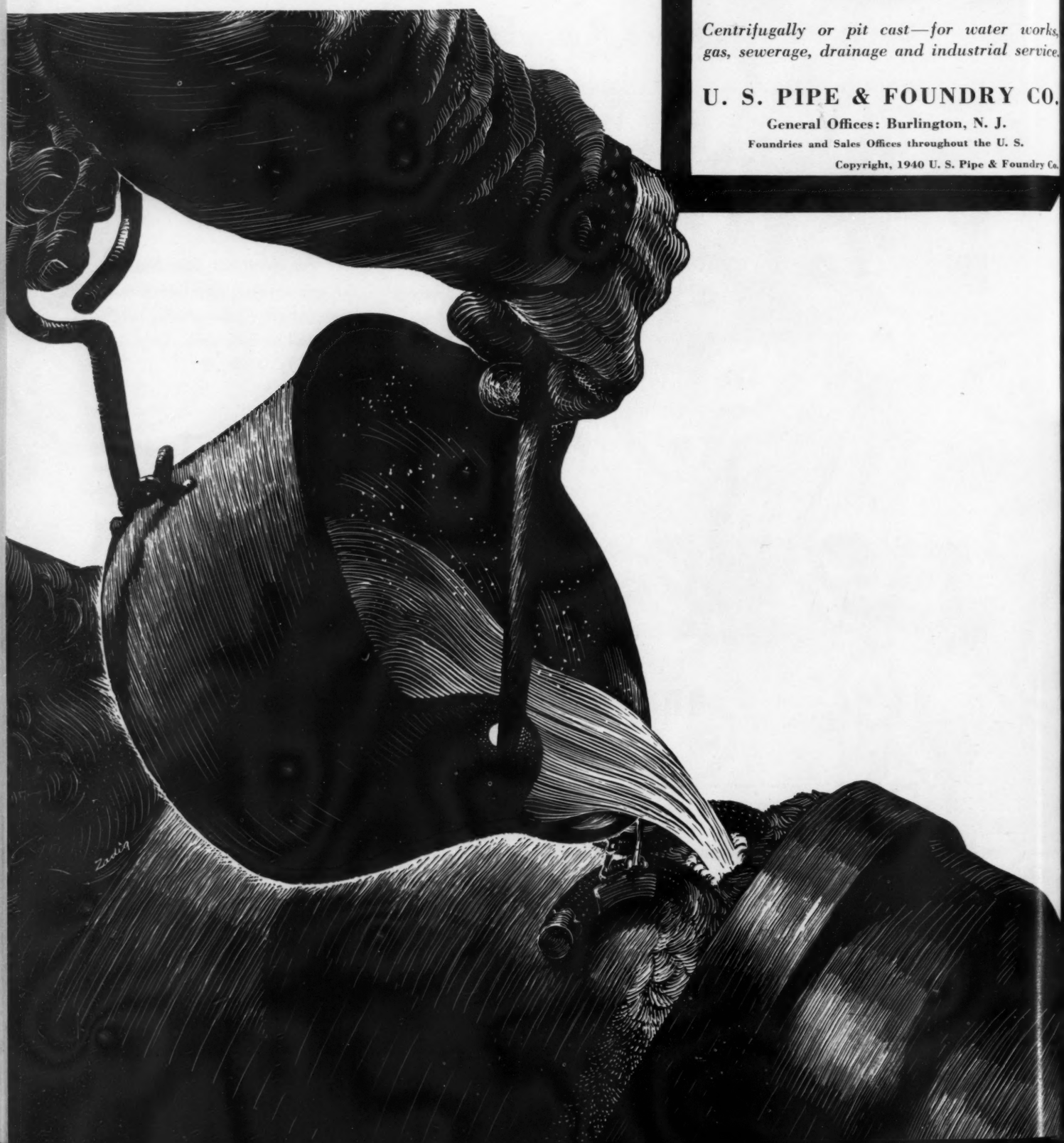
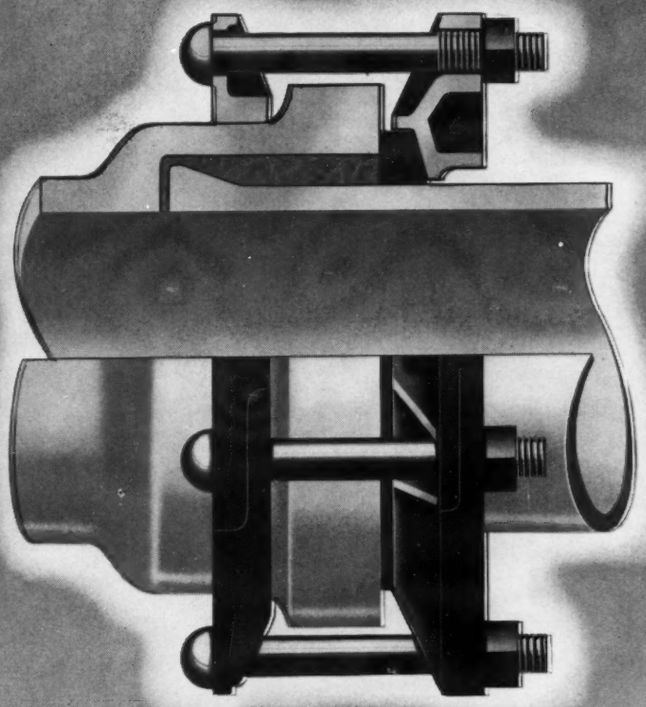
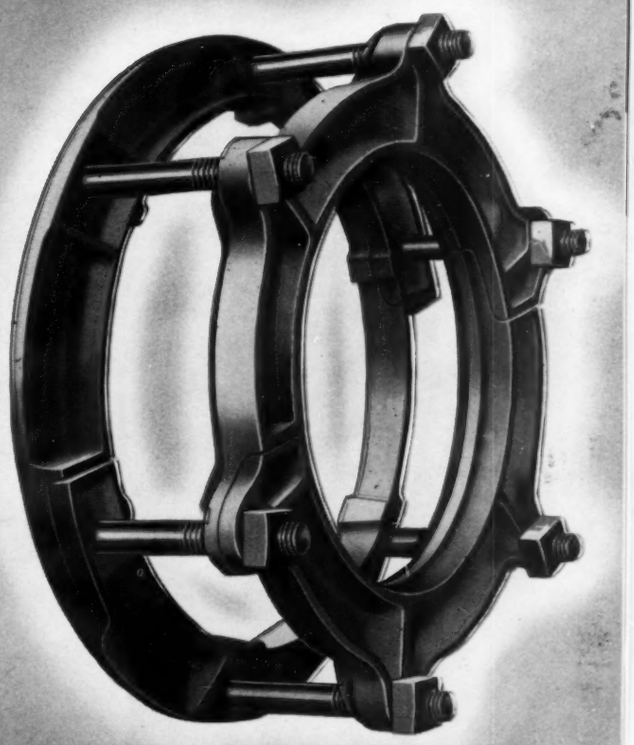


THE *Dayton* 12-B CLAMP



for Quick, Efficient and Economical

REPAIR OF BELL JOINT LEAKS



Note the simplicity of design that minimizes number of parts—eliminates adjustments and contributes to economical installation.

Note the substantial construction that provides essential rigidity—assures a true fitting clamp completely surrounding the spigot and precludes any clamp distortion under bolt pressure.

THE NATIONAL SUPPLY COMPANY

NATIONAL

GRANT BUILDING . . . PITTSBURGH, PENNA.

"Repeat Orders CONVEY OUR FEELINGS"

says Mr. S. B. Severson, Vice President, Dominion Natural Gas Co., Ltd.; Republic Light, Heat & Power Co., Inc. Read his letter.

DOMINION NATURAL GAS COMPANY, LIMITED
REPUBLIC LIGHT, HEAT & POWER COMPANY, INC.
AND ASSOCIATED COMPANIES
JACKSON BUILDING
BUFFALO, N.Y.

June 10, 1940

Mr. G. M. Kirkpatrick
Blaw-Knox Company
Pittsburgh, Penna.

Dear Sir:

As users of Gas Cleaners, even before their manufacture by your Company, we feel that the recurrence of repeat orders for your cleaners should convey to you our feelings as to their efficiency and economy.

The first Blaw-Knox Cleaner to be used by us was at a distribution system town border station where complaint calls due to dust were occurring in alarming numbers. Within a few hours after placing the Cleaner in operation, a decrease in complaints was noted, and in about a month had almost ceased. This Cleaner is still in continuous operation.

During the succeeding years, additional Cleaners of various sizes and degrees of improvement have been installed, and all are doing their work satisfactorily.

Recently a Cleaner which to all appearances was collecting no dust was temporarily removed to another location, upon which the number of complaints from users of automatic equipment showed an immediate increase, and stopped with the installation of a new Cleaner.

It is also our standard practice to use your units in front of Compressor Stations to forestall damage to equipment by pipeline dust.

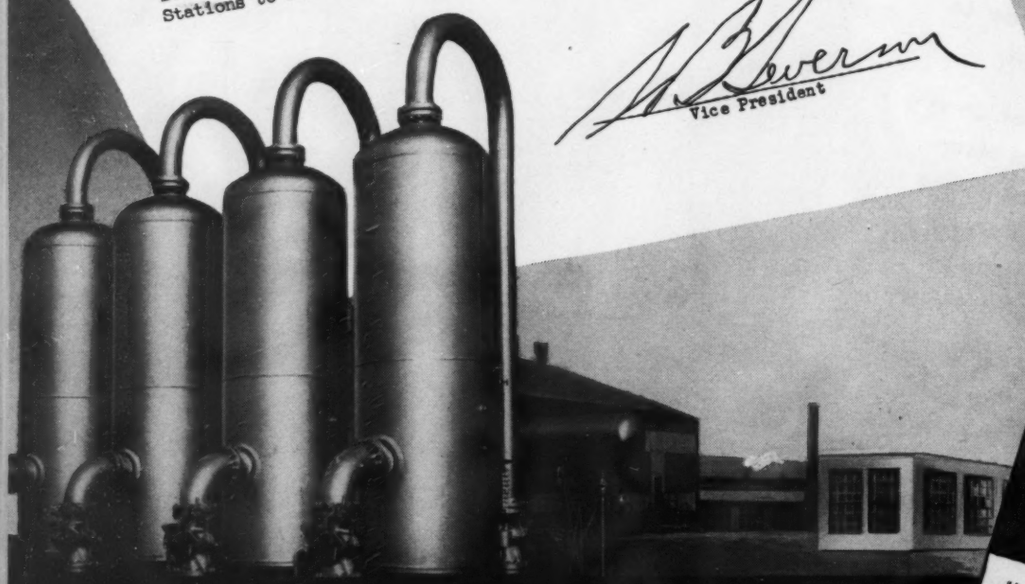
Yours very truly

Vice President

The part that Blaw-Knox Gas Conditioning plays in maintaining consumer goodwill, reducing service calls and protecting equipment is daily receiving increased recognition by gas companies. Proof of this is found in repeat orders from concerns who, having proved Blaw-Knox Gas Conditioners to their own satisfaction, buy additional units. Our Bulletin No. 1578 describes Blaw-Knox Gas Conditioning equipment in detail and explains why leading operating engineers prefer it. Ask for a copy.

. . . BLAW-KNOX GAS CONDITIONING GIVES

1. —High capacity, gives full value per dollar invested.
2. —Gas is thoroughly cleaned . . . no halfway measures. Dust and other foreign matter are dynamically forced into intimate contact with washing liquid.
3. —Delivers perfectly clean, dry gas. (If desired, equipment will resaturate with oil or water vapor.)
4. —Pressure losses cut. Very little loss in contacting and separating sections.
5. —Dust and dirt are completely removed from gas flow.
6. —Blaw-Knox Gas Conditioners are the result of many years' research and experience specifically directed toward meeting your requirements for the continuous delivery of clean, conditioned gas, the Ideal Fuel.



More than ever your profits depend upon gas flowing—smoothly, surely—through the burners of modern appliances. That's a test that only clean gas can meet. Banish burner-clogging with Blaw-Knox Gas Conditioning. Remember—clean gas makes satisfied customers.

BLAW-KNOX
GAS CONDITIONERS

BLAW-KNOX DIVISION of Blaw-Knox Company • FARMERS BANK BLDG., PITTSBURGH, PA.

NOW WE'RE TELLING THE WORLD ABOUT *Wilcolator*

The Wilcolator
WARRANTY BOND
THE WILCOLATOR OVEN HEAT CONTROL, has been selected by the manufacturer of this range because of its excellent operation in combination with this oven.
THE WILCOLATOR OVEN HEAT CONTROL is listed as approved by the American Gas Association, Inc. (gas) and the National Board of Fire Underwriters (for gas; Group 1). It complies with the requirements of the A. G. A. Testing Laboratories (for gas) and the National Board of Fire Underwriters' Testing Laboratories (for electricity) for excellence of materials, workmanship and performance.
PROPERLY ADJUSTED, the WILCOLATOR will maintain the oven temperature in accordance with the selected, final temperature, within the specifications required for most efficient operation of this oven.
THE WILCOLATOR OVEN HEAT CONTROL conserves fuel by measuring the amount used to fit the baking operation. Only the right amount is used and none is wasted.
THE WILCOLATOR OVEN HEAT CONTROL eliminates guess work and unnecessary by properly controlling the amount of fuel used to secure the best results from the oven.
THE WILCOLATOR OVEN HEAT CONTROL ends "oven watching." No need to open the oven door to observe the progress of cooking. The heat control performs its task automatically without attention.
WILCOLATOR
THE WILCOLATOR COMPANY • NEWARK, N. J.

Good Cooks choose WILCOLATOR OVEN HEAT CONTROL
They Know its Greater Accuracy means Better Baking
Before you buy your new range, listen to the advice of good cooks who know the importance of an accurate, dependable oven heat control. Be sure your new range is Wilcolator equipped!
Manufacturers of quality ranges select Wilcolator because of its excellent operation with their ovens. For one thing, it's made by the company which pioneered and developed the modern oven heat control. For another, it's backed by the Wilcolator Bond, that tells you exactly what your Wilcolator will do . . . how it saves fuel by measuring the exact amount needed . . . how it takes the guesswork out of baking temperatures . . . how it ends oven-watching . . . automatically.
Insist on Wilcolator's economy, accuracy, *complete dependability.*
Look for this seal on your new oven.
FREE! NEW COOK BOOK
20 pages of recipes; new, tempting, easy-to-make. Mail coupon today to The Wilcolator Co., Newark, N. J.
Name
Address
WILCOLATOR
OVEN HEAT CONTROLS

Starting in October Good Housekeeping

You don't need to be told how the Wilcolator Warranty Bond has captured prospects' attention . . . held their interest . . . helped you close sale after sale. You know all about it —*through actual experience.*

And now—Wilcolator makes this sensational help *even more valuable,* even more important to you in your selling. Because starting in October, Wilcolator brings the tremendous prestige and enormous sales power of Good Housekeeping Magazine squarely behind Wilcolator and the Wilcolator Warranty Bond.

Think of the impact of full-column advertisements reaching over 2,320,000 prospective range buyers who read this magazine regularly! Think of the powerful effect these ads will have on the sale of your Wilcolator equipped ranges! Tie in! *Feature* Wilcolator more than ever before! And, *of course,* send immediately for the 5 free "tie in" helps below!

Write today to THE WILCOLATOR COMPANY, Newark, New Jersey.

WRITE FOR THESE *FREE* SALES HELPS

WILCOLATOR WARRANTY BONDS — Now more than ever, a real "must" in selling ranges!

MOUNTED REPRINTS GOOD HOUSEKEEPING ADS—For your windows, for your counters!

"GUARANTEED AS ADVERTISED" Good Housekeeping Seal—paste on every Wilcolator equipped range on the floor.

RECIPE BOOKLETS — 30 pages of tempting, new recipes offered in national advertising. Give them away free.

WILCOLATOR DISPLAY — Attractive colors. Features Warranty Bond. Put on top of Wilcolator equipped range.

WILCOLATOR OVEN CONTROLS

RESCUED WITH A BY-PASS

A CASE STORY

SOLVED WITH PREVENTIVE MAINTENANCE

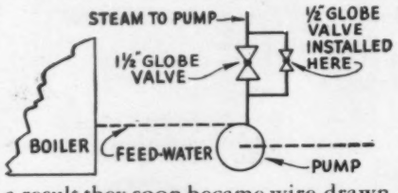
"Man alive"—shouted the SUPERINTENDENT—"we just replaced that valve a short time ago!"

"But we can't let the pump run wild"—the PLANT ENGINEER tried to explain.

"Sure enough"—said the CRANE MAN—"but Preventive Maintenance will stop the source of trouble."

AN eastern plant was having endless trouble with a valve on the boiler feed pump. It was a steam-driven pump—controlled with a 1½-inch globe valve.

Under peak loads or in an emergency, this valve was ideal. But for normal feed-water needs it was much too large. Most of the time the steam was throttled so close that the disc and seat were barely "cracked." As



a result they soon became wire-drawn and the valve began to leak—a dangerous and wasteful condition.

Pulling the fire to make valve repairs was costly. A permanent remedy for the trouble had to be found. "Here is a case for Preventive Maintenance," said the Superintendent as he called in D. N. G., the Crane Man, on the problem.

Preventive Maintenance counseled the installation of a ½-inch globe valve in a by-pass line around the present valve. With the large valve closed tight, the ½-inch valve, when fully open, would assure ample steam for normal pump operation. For emergency loads, the 1½-inch valve would be available—but rescued from severe throttling service.

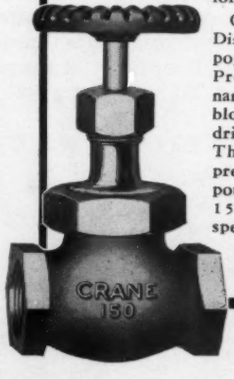
Results: (1) The trouble was eliminated—permanently, easily. (2) Again Preventive Maintenance paid for itself many times over. (3) Another management knows that it can rely on Crane for sound advice and the right valves and fittings to solve every piping problem. Knows, too, that it's best to call the Crane Representative whether the trouble is big or little.

This case is based on an actual experience of a Crane Representative in our Syracuse Branch.

FINE FLOW CONTROL WITH CRANE BRASS PLUG DISC VALVES

In any service—steam, water, oil, gas—where valves must operate in partly open position or are frequently opened and closed, in every way these valves will give better performance than you would expect.

Crane plug-type disc construction assures accurate and easy regulation of flow, and a longer life of positive tightness. The wide seating surface and the perfect combination of alloys in the tapered disc and seat give unusual resistance to the damage of foreign matter and wire-drawing, to wear and galling. A sturdy brass body and careful engineering in every part make these valves extra fit for the toughest jobs.



Crane Brass Plug Disc Valves are the popular choice for Preventive Maintenance on sootblower, blow-off, boiler feed, drip and drain lines. They're made for pressures up to 350 pounds at 550°. For 150 pound lines, specify No. 14½P.

1940 and 85th YEAR

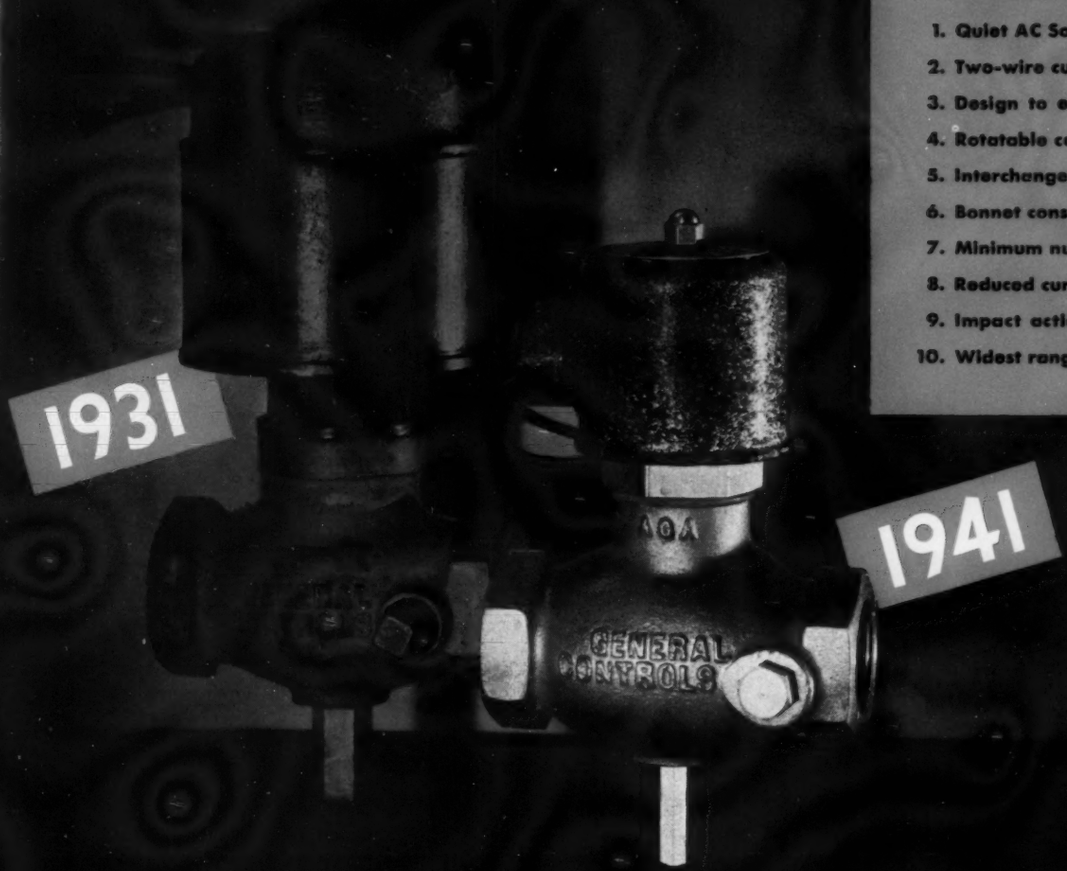
CRANE

CRANE CO., GENERAL OFFICES:
836 S. MICHIGAN AVE., CHICAGO

VALVES • FITTINGS • PIPE
PLUMBING • HEATING • PUMPS

NATION-WIDE SERVICE THROUGH BRANCHES AND WHOLESALERS IN ALL MARKETS

10 YEARS AHEAD



THEN AND NOW
10 OUTSTANDING ADVANTAGES

1. Quiet AC Solenoids
2. Two-wire current failure principle
3. Design to eliminate magnetic sticking
4. Rotatable conduit connection
5. Interchangeable coils
6. Bonnet construction for accessibility
7. Minimum number of working parts
8. Reduced current consumption
9. Impact action stainless steel plunger
10. Widest range in sizes, ¾" to 6"

¾" GENERAL CONTROLS TYPE K-3B MAGNETIC GAS VALVE *THEN* AND *NOW*

LOOK AT THE RECORD OF THE PIONEER AND LEADER IN THE MANUFACTURE OF SOLENOID VALVES TO LEARN THE REASONS FOR THE UNIVERSAL ACCEPTANCE OF GENERAL CONTROLS

General Controls is one of the world's largest manufacturers of 2-wire controls. The sales leader of all General Controls is the Type K-3B Magnetic Gas Valve. Such popularity must be deserved.

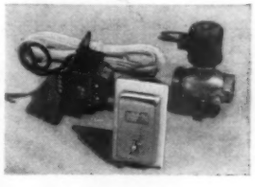
Look at the record. In 1931 General Controls was first with a two-wire, current failure, quiet AC valve with a rotatable terminal junction, definitely designed to eliminate magnetic sticking. In combination, these advantages were not available in any other solenoid valves 10 years ago. The K-3B won immediate acceptance.

Three years later General Controls was first to incorporate interchangeable coils; first to utilize bonnet union construction for accessibility to working parts; first to reduce solenoid size; first to really lessen current consumption.

All this made a better valve for the industry at a lower cost. How fundamentally correct each of these were! For the Type K-3B is of the same basic design now—as then. Because of constant improvement, exhaustive testing, rigid inspection, the Type K-3B rides the wave of universal acceptance.

Before you buy—compare. Type K-3B valves are available in the widest ranges of sizes, from ⅜" to 6", fulfilling the requirement of most gas applications. 1940 Catalog gives full details. Write for it.

•



T-30 GAS HEATING PACKAGE SET
Includes humless Type K-3B gas valve, the new T-70-1 two-wire, low voltage thermostat, transformer and 30 feet of wire. Night shut-off and heat anticipation available.

GENERAL CONTROLS

450 East Ohio Street, Chicago, Illinois • 25 North Live Oak Street, Houston, Texas • 1505 Broadway, Cleveland, Ohio • 421 Southwest Boulevard, Kansas City, Missouri • 915 Bryant Street, San Francisco, California • 267 Fifth Avenue, New York City • 700 West Ivy Street, Glendale, California • 6432 Cass Avenue, Detroit, Michigan • 687 Boylston Street, Boston, Massachusetts • *Distributors in all principal cities.*

MEET THE CHALLENGE OF THOSE

"IN-BETWEEN" JOBS

WITH PORTABLE VERSATILE BARCOs

• For hammer work inaccessible to heavy cumbersome equipment . . . or on small but necessary jobs where it's neither practical nor economical to send a bulky hammer outfit . . . or where hand methods are too slow and costly . . . that's where the BARCO Hammer comes into its own as an indispensable tool. It's portable—can be rushed to job sites in small truck or service car—is light enough for one man to carry the whole unit, if necessary. Yet its power can handle the whole range of hammer jobs with ease and at rock-bottom operating costs.

To realize how dependably and economically a BARCO performs—how it fills a vital need on dozens of those "in-between" jobs that every contractor runs up against—you've got to see one in action—preferably on one of your own jobs. Ask us for a demonstration.

BARCO MANUFACTURING CO. 1830 Winnemac Ave., CHICAGO, ILLINOIS

BARCO *Portable* GASOLINE HAMMER

All stuffing-box type mechanical joints made by Members of The Cast Iron Pipe Research Association are bottle-tight under high pressures. They differ in design but are identical in principle.

CAST IRON PIPE

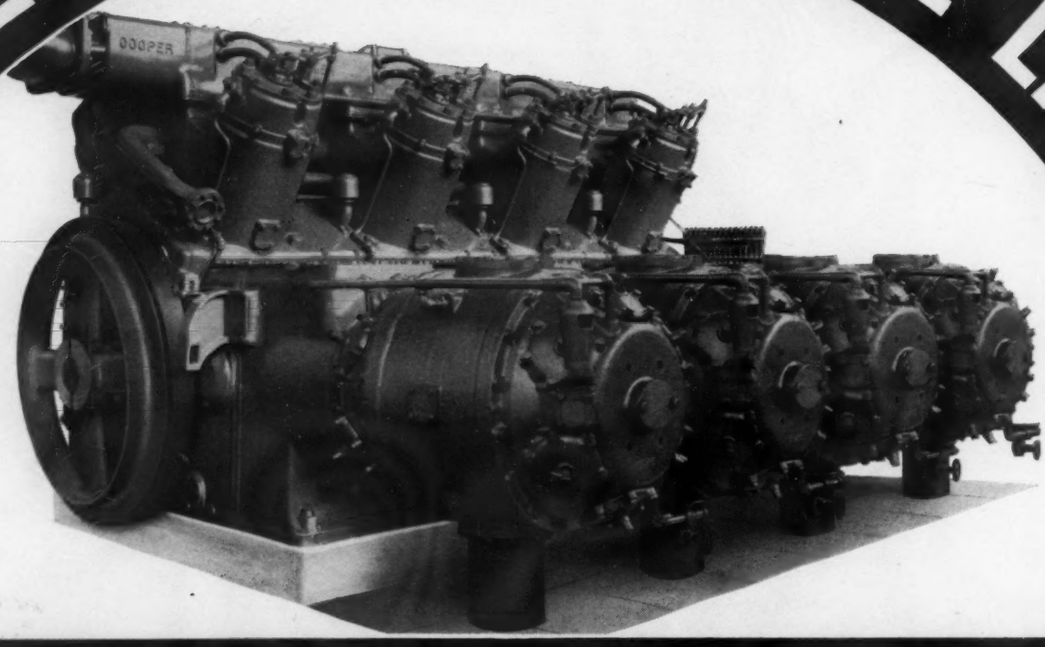
THE STANDARD MATERIAL FOR UNDERGROUND MAINS

A PIPE material with a useful life of a century–with a leak-proof joint combining the main advantages of a flexible coupling and an expansion joint–the answer to a gas distribution engineer's prayer–is cast iron pipe with stuffing-box type mechanical joints.

Look for the "Q-Check" registered trade mark. Cast iron pipe is made in diameters from 1¼ to 84 inches.

THE CAST IRON PIPE RESEARCH ASSOCIATION, THOMAS F. WOLFE, RESEARCH ENGINEER, 1013 PEOPLES GAS BUILDING, CHICAGO, ILLINOIS

MORE HOURS ON THE LINE



. . . and here's why . . .

- Medium Speed (300 rpm) means Less Wear and Fewer Repairs.
- Oil-cooled Pistons assure Less Piston Ring and Cylinder Wear.
- Meehanite Metal for all iron castings gives Unexcelled Strength.
- Patented Connecting Rods afford Double Bearing Surface.
- Precision Type Bearings are Interchangeable and Renewable in the field, *without* hand fitting or scraping.
- Full-pressure Lubrication automatically Protects Main, Crankpin, Piston Pin and Auxiliary Drive Shaft Bearings.
- Power Pistons electrolytically coated for Closer Clearance and Maximum Efficiency.
- Streamline Scavenging and Controlled Gas Injection mean Efficient Combustion and Less Carbon . . . Less Liner and Ring wear!

WITH TYPE GM V ANGLE'S!

Fours, Sixes, Eights—400, 600 and 800 hp.

WRITE FOR THE NEW TYPE GM V ANGLE BULLETIN

THE COOPER-BESSEMER CORPORATION

640 EAST 61st STREET . . . LOS ANGELES, CALIFORNIA

25 West 43rd Street, New York City — Mills Building, Washington, D. C. — 631 Spring Street, Shreveport, Louisiana — 201 East 1st Street, Tulsa, Oklahoma
Magnolia Building, Dallas, Texas — 529 M & M Building, Houston, Texas

Mount Vernon, Ohio — PLANTS — Grove City, Pennsylvania

PENTALARM PROTECTS IMPORTANT PIPELINE INVESTMENTS

BY ADEQUATE ODORIZATION

MORE and more are the great pipeline systems of the nation turning to PENTALARM for safe, adequate odorization . . . at a cost of less than 1/10 of a cent per 1000 cu. ft. of gas! PENTALARM vapors are so powerful they penetrate wet soil where other odorants might be absorbed. Two 55-gallon drums of PENTALARM will odorize 1 billion cu. ft. of gas!

The introduction of PENTALARM into the system is so simple that the opening or closing of a valve gives accurate, positive control. And the new PENTALARM COLORIMETER makes a lasting, indisputable record of the intensity of your pipeline odorization.

●

ILLUSTRATED BOOKLET ON THE NEW PENTALARM COLORIMETER MAILED ON REQUEST

SHARPLES TRADE MARK SOLVENTS

THE SHARPLES SOLVENTS CORP.

PHILADELPHIA CHICAGO NEW YORK

This low-cost method Reduced Total Unaccounted-for Gas Loss 52.5%

Report shows "CARBOSEAL" anti-leak is effective remedy for leakage in Dry Bell-and-Spigot Joints

A COMPANY operating several properties completed "Carboseal" anti-leak treatment of one entire system at a total cost of $4,500. The system consisted of 82,310 ft. of steel main and 77,378 ft. of cast iron main. Tests extending over three months subsequent to the treatment showed a reduction in unaccounted-for gas loss amounting to 2,782,800 cu. ft. This represented a saving of 52.5 per cent compared with the entire system's loss for the corresponding three months of the previous year. These results were better than expected because the "Carboseal" anti-leak treatment corrected joint leakage in the cast iron main only, and the actual cast iron mileage was only 47.5 per cent of the total.

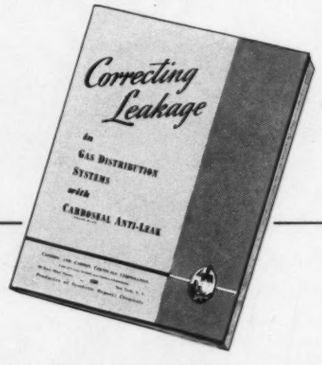
These results are typical of the experiences of more than 250 "Carboseal" anti-leak users throughout the country.

How "Carboseal" Anti-Leak Works

"Carboseal" anti-leak, a scientifically developed liquid, is introduced into the mains at high points and flows over the joints by gravity to the drips where the surplus is recovered for re-use. It can also be sprayed into the mains by means of a hose. Both of these methods are used without interrupting gas service, and without making expensive joint excavations.

"Carboseal" anti-leak cuts tar and gum deposits in the joints and swells dried-out jute packing to its fullest extent, so that the packing fills the voids. Its application also saturates dust and rust lying in the bottom of the main, holding it in place and preventing it from being carried by the gas into customer appliances. Joints treated with "Carboseal" anti-leak keep gas inside the mains and remain tight indefinitely.

Get A Copy of This New Book!



It will pay you to send for a copy of this book which incorporates in compact form all the essential facts about "Carboseal" anti-leak, the methods of application, comparative costs, and results obtained. Possibly this inexpensive and economical method of correcting joint leakage can be used to advantage in your system.

A request on your company letterhead will bring you a copy, without obligation.

CARBIDE AND CARBON CHEMICALS CORPORATION

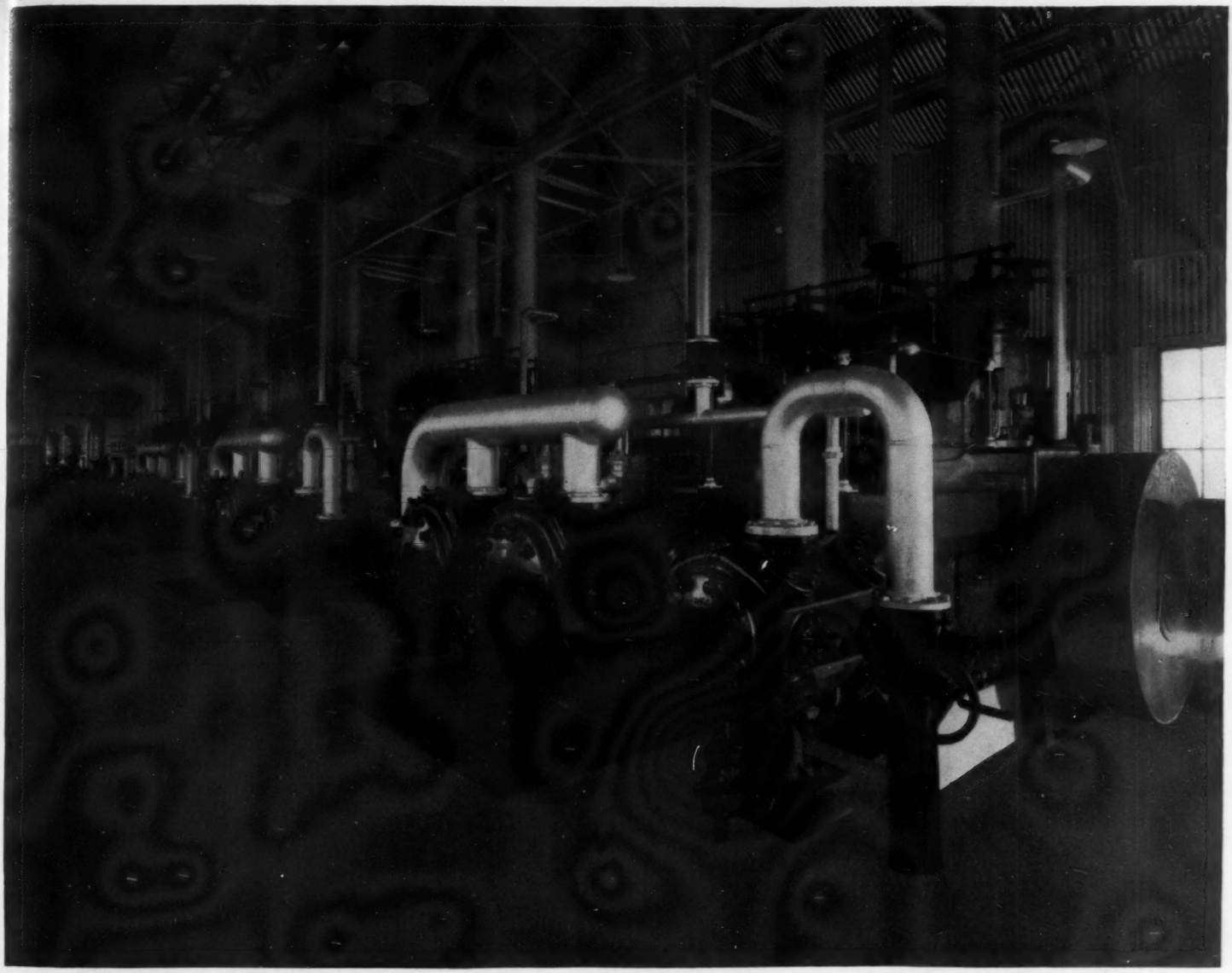
Unit of Union Carbide and Carbon Corporation

UCC

30 East 42nd Street, New York, N. Y.

PRODUCERS OF SYNTHETIC ORGANIC CHEMICALS

The word "Carboseal" is a registered trade-mark of Carbide and Carbon Chemicals Corporation.



CLARK "ANGLES" IN K.M.A. FIELD

equipped to give low and high pressure service

• In Continental Oil Company's three natural gasoline and repressuring plants in the K. M. A. Field at Wichita Falls, Texas, CLARK "Super-2-Angle" Compressors have been especially equipped for both low and high-pressure service.

In low-pressure service the compressors are being used for extracting gasoline from the wet gas. In high-pressure service they are being used for maintaining reservoir pressure in the field, by boosting the dry gas and returning it to the formation. To serve this dual purpose, each unit has been equipped with low, intermediate and high compression cylinders.

The three-plant system at K. M. A. was originally set up in 1938 with two CLARK 400 H. P. "Angles" in the main plant, one in the No. 1 auxiliary plant, and two in the No. 2 auxiliary plant. The system has been gradually expanded, and today the main plant (shown above) contains 7 CLARK units totalling 3200 H. P.; the No. 1 plant contains 3 CLARK units totalling 1400 H. P.; and the No. 2 plant contains 10 CLARK units totalling 4000 H. P. The entire system, with 8600 H. P. of CLARK Compressors, is one of the largest of its kind in the world. The plant handles approximately 36,000,000 cu. ft. of gas per day. The gas comes in at 10 in. vacuum to 43 lbs. gauge and is returned to the formation at 1500 to 2000 lbs. pressure.

800 H. P. of the CLARK Compressors was installed for refrigeration service in connection with the recovery of Propane and Butane.

CLARK "Angle" Compressors are being used in the Industry's most important gasoline and recycling plants, gas booster stations and refineries. Our nearest sales office will be glad to supply full information.

CLARK BROS. CO., INC.
OLEAN, NEW YORK, U. S. A.

Export Office: 30 Rockefeller Plaza, New York. Domestic Sales Offices and Warehouses: Tulsa, Okla.; Houston, Texas; Chicago, Ill.; Boston, Mass. (131 Clarendon Street). West Coast Office: The Smith-Booth-Usher Company, Los Angeles, Calif. Foreign Offices: 72 Turnmill Street, E. C. 1, London; 4 Str. Gen. Poetas, Bucharest, Roumania.

CLARK

ALREADY THIS YEAR, SEVERAL THOUSAND MILES OF PIPELINE CONSTRUCTION HAVE BEEN PROTECTED WITH

Barrett
PIPELINE ENAMEL

This year even more than ever before, it's Barrett the country over. Barrett Pipeline protection has been applied to the greatest pipeline projects built in the U. S. A. in 1940. Some of the major pipeline companies or owners who are using Barrett Enamel are:

Pacific Gas & Electric Co.
Southern Counties Gas Co. of Calif.
Santa Maria Gas Co.
Long Beach Gas Division City of Long Beach, Calif.
Central Arizona Light & Power Co.
El Paso Natural Gas Co.
Louisiana Power & Light Co.
Mississippi Power & Light Co.
Memphis Natural Gas Co.
Southeastern Pipeline Co.
Lone Star Gas Co.
Dow Chemical Co.
Southern Union Gas Co.
Valley Pipeline Co.
Dallas Gas Co.
San Antonio Public Service Co.
New Orleans Public Service Co.
United Gas Pipeline Co.
Atlanta Gas Light Co.
Calcasieu Sulphate Paper Co.
Hunt Oil Co.
Hanlon Gasoline Corp.
Davis Oil Co.
Southern Natural Gas
Peoples Water & Gas Co.
Southern Minerals Corp.
Gulf Oil Co.
Pure Oil Co.
Continental Oil Co.
Phillips Petroleum Co.
Panhandle Eastern Pipeline Co.
Northern Natural Gas Co.
Montana Dakota Utilities Co.
Atlantic Refining Co.
Dayton Power & Light Co.
Montana Power Co.
Penna. Power & Light Co.
Consolidated Edison Co. of N. Y.
Public Service Electric & Gas Co.
Central Illinois Public Service Co.
Cities Service Gas Co.
Consumer Power Co.
Houston Pipeline Co.

THE BARRETT COMPANY, 40 RECTOR STREET, NEW YORK, N. Y.

DRESSER BELL-JOINT CLAMPS
MEET THE PROBLEM OF ODD-SIZE BELLS AS EASILY AS YOU ADJUST YOUR BELT!...

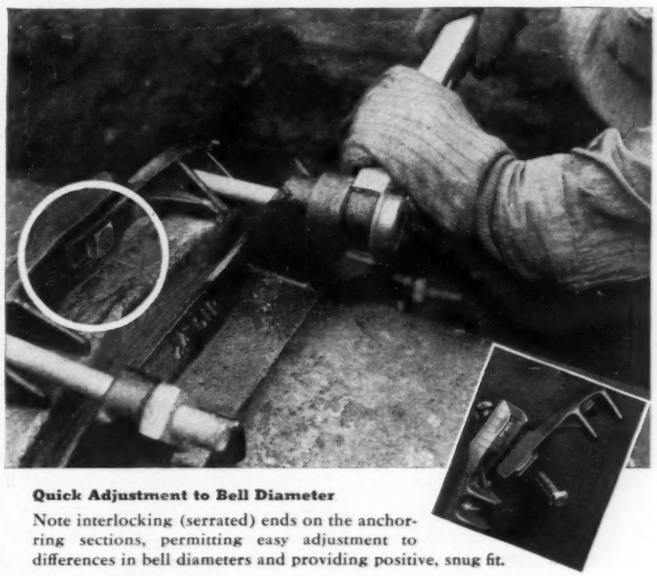
The Style 60 is adjusted as easily as your belt. In addition, it is actually more rigid than other clamps having rings of fixed diameter. *Result:* Adjustability plus a positive, uniform, pressure-tight pack on *any* size pipe! This is due to Style 60 construction—to the use of the clips in the follower ring to maintain a continuous pack—to the correct distribution of metal, to the soundness of design, and the high-strength malleable iron.

No Grinding, Brazing, Shims, or "Make-Shift" Methods. With Style 60's, there's no time-consuming tinkering on the job, such as trying to make a clamp fit by grinding out the clamp rings or brazing on lugs, which may weaken the original metal, throw off the entire design, reduce gasket pressure and confinement, make the rings become iron-bound, or permit "rolling." Nor is there any bending of the clamp bolts to clear the shoulder of the bell, no "rocking" of the rings, no areas of low gasket-pressure in gaps between rings, no improper seating of anchor ring on bell. All that is done away with when you use Dresser Style 60. It's the one Clamp that has *true* adjustability.

Dresser Style 60, with rare exceptions, fits everything under the ground. That's why you carry fewer sizes of these Clamps in stock. Your men don't make return trips to the warehouse for proper sizes, or try to "make incorrect sizes do." *Send today for Folder 3612G,* which gives complete list of Style 60 advantages.

DRESSER MANUFACTURING COMPANY, BRADFORD, PA.

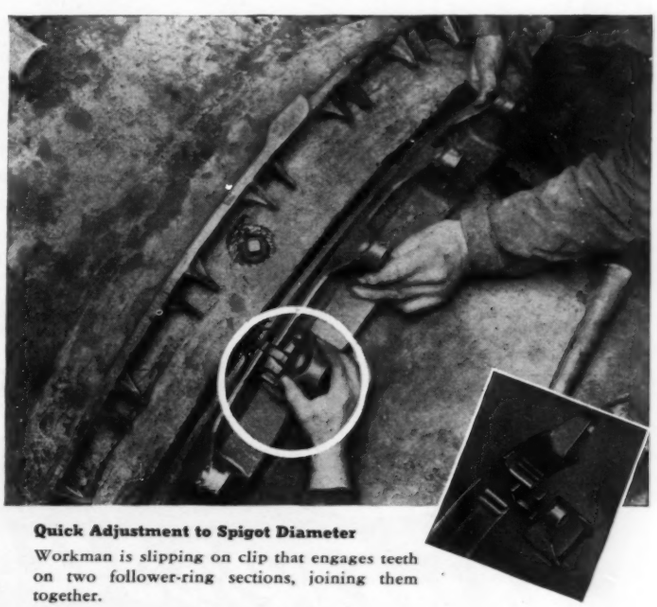
New York: 17 East 42nd St.; Chicago: Peoples Gas Bldg.; Houston: Commerce Bldg.; San Francisco: 1038 Polk St. In Canada . . . Dresser Manufacturing Company, Limited . . . 60 Front Street, West, Toronto, Ontario



Quick Adjustment to Bell Diameter

Note interlocking (serrated) ends on the anchor-ring sections, permitting easy adjustment to differences in bell diameters and providing positive, snug fit.

In the Square: Close-up of serrated ends on anchor-ring sections. Section bolt holds sections together.



Quick Adjustment to Spigot Diameter

Workman is slipping on clip that engages teeth on two follower-ring sections, joining them together.

In the Square: Close-up of follower ring showing wide range of adjustment around spigot through use of clips and removable fillers. Fillers are same cross-section as follower ring, providing an unbroken pack against gaskets, an *exclusive Dresser feature.*

DRESSER *Bell-Joint Clamps* STYLE 60

UNIVERSAL ★ Rawson

A COAL-WOOD KITCHEN HEATER RANGE THAT EMPHASIZES THE BASIC ADVANTAGES OF GAS AS THE IDEAL COOKING FUEL..!

● The new Rawson Universal coal-wood kitchen heater gas range focuses attention on the proved superiority of gas for all cooking purposes by reason of the advanced devices incorporated in the range, such as Simmer-Save Burners, Draftless Precision Oven, and In-A-Drawer Broiler with Savory Smoke-proof Broiler Grid.

The coal-wood heating section is so designed that it can be easily converted to the use of oil as fuel.

The Rawson is distinctly modern from a design standpoint and in addition, offers outstanding value per dollar of cost. There exists in many communities a substantial market for the sale of kitchen heater ranges, and the Rawson is the ideal unit for the gas company to feature as it not only gives superior performance from a heating viewpoint, but also assures a new and higher standard of cooking performance in top-burner, broiling and oven cooking.

Universal GAS RANGES

MANUFACTURED BY CRIBBEN & SEXTON CO.
700 N. SACRAMENTO BLVD., CHICAGO, ILLINOIS

BEACON Universal

WITH GAS KITCHEN HEATING UNIT

The Beacon Universal gives the same assurance of outstanding service and cooking performance as does the Rawson Universal. The Beacon, however, is a straight gas consuming appliance in that it utilizes gas for cooking as well as for heating. The gas kitchen heating unit has been engineered to assure utmost efficiency and economy of operation, and is equipped with full automatic devices to give an automatic gas kitchen heating service.

GUEST Editorial

To Better Serve
OUR BASIC LOAD

By A. E. HOLLOWAY

Vice President in Charge of Sales, San Diego
Consolidated Gas & Electric Co.*

ACHIEVEMENT, no matter how encompassing its influence, is worthy of commendation. We, of the Gas Industry, are certainly justified in proudly proclaiming many recent accomplishments, particularly in our endeavors toward the automatic operation of domestic appliances. Our crowning glory was the Certified Performance range, a product of combined intellect, a product that will give us leadership in the field of domestic cooking, and one that will re-focus the eyes of womankind on gas equipment. But, let us ask ourselves this question: "Has the Gas Industry proclaimed these improvements in home comfort and convenience to a point where the housewife realizes the many benefits to be gained through ownership and use of this new equipment?"

The CP Range can and does contribute as much, or more, to modern living than any other type of cooking equipment manufactured today, but somewhere along the line we have failed to establish it as a symbol of modernity. We have neglected to follow the lead of most modern industries and weave a web of irresistable romance around the advantages to be gained through ownership. Ask any number of women today the question, "What is the most modern cooking equipment on the market today?" You'll be disappointed in your findings because, in my experience, very few mention the CP range. Then ask these same women the leading question, "Have you heard of the CP range?" One or two answers will be in the affirmative, but with the reservation "I guess it's a nice range, but it costs too much."

Self-satisfaction is a most dangerous obstacle to progress. Having produced the Certified Performance range, which no one could deny was a marvelous contribution to the cooking arts, we have failed to dress it up and give it the romantic send-off it so justly deserved. On the contrary, we embarked on a price selling basis and impressed our prospect from the price angle, thereby reducing the "class" of cooking equipment to something commonplace and synonymous to a basement bargain.

Too long have we permitted the benefits of improvements in gas equipment to be taken for granted. Too long have we refused to employ the adjectives and superlatives of modern promotion. We can, and do, produce equipment that will support the use of most enthusiastic "copy" and salesmanship. I recommend a generous support to all promotional efforts along such a line. Let us forget price complex and sell value of service and pride of ownership. Enthuse our sales outlets on the many advantages offered the purchaser of this equipment so that every woman will demand a CP gas range. This is not easy. Every woman judges the results of a gas range by the one she has used for the last 10 years. It is our job to let her know that this is not just another gas range but a modern cooking instrument designed for her comfort and convenience and one that will give results never dreamed of before.

THE domestic cooking load is our basic business. To perform this work, we have a fuel and equipment second to none—modern, economical, automatic, streamlined, beautiful and convenient. We must tell this story to the women of America in such a way that they will be impressed by the value of the service rendered to the point where the "price angle" becomes secondary. Our national advertising campaign has accomplished much toward this end, but this must be backed by strong local sales appeals, intelligent salesmanship, convincing demonstration and advertising with plenty of "Class" and modern superlatives.

At the same time, continued research and improvement in gas utilization equipment must be carried on in order that the public opinion will be directed to the progressiveness of our Industry.

*Mr. Holloway is president of the Pacific Coast Gas Association, which meets this month in annual convention at San Diego.

KITSON

GAS STOPS

"More Popular than Ever"

IN THE AMERICAN GAS INDUSTRY

G-201 Flathead Standard Gas Stop in sizes ¼ inch to 2 inches.

During the many years we have manufactured high quality brass goods for the Gas Industry, we have tried to maintain a mutual viewpoint. Let us explain.

Technical progress in any industry continually throws a greater responsibility on the equipment the industry uses.

KITSON has never lost sight of this responsibility, which explains the finest metal, precision tooling, and rigid testing that are built into every K-CO gas stop.

The K-CO line of gas stops is complete for all specifications, pressures, and sizes in regular gas operating practice.

In addition, we also manufacture protective controls for automatic and manual gas water heaters.

Every gas man who buys stops or relief valves should have a copy of our Catalog "A"

KITSON COMPANY
2409-15 Westmoreland St., Philadelphia, Pa.
Manufacturers of Kitson Safety Controls for manual and automatic Water Heaters . . . Quality Brass Goods for Gas, Water and All Plumbing Uses.

THERMALLY *Thinking*

Alien Registration

Registration and fingerprinting of all aliens resident in the United States started on August 27 and extends through to December 26 of this year. This is a job that common sense dictates should be done in the interests of national defense. But common sense as well as common decency both dictate that it should be accomplished without creating resentment or disloyalty on the part of law-abiding residents of this country who for some reason or other may not have found it expedient or even possible to relinquish their citizenship in the countries of their origin.

Personnel departments of the utilities should call the attention of all employes to the provisions of the act. It should be done in such a manner that conscientious and faithful workers will realize that the very act of registering is in itself an evidence of their willingness to cooperate with the Government.

No greater disservice could be done to Democracy than to create the impression among non-naturalized aliens that they are today suspects, and tomorrow destined to be pariahs.

Look to the Rural Consumer

Recent figures on the growth of the electrical industry indicate that during a 12-months period the number of residential or domestic customers has increased 3.2%; and yet during the same period the number of rural users has increased 19.3%. For the same period the total number of domestic gas customers has increased 2.4%.

The gas industry doesn't break its figures down into urban and rural, for the simple reason that its rural business is practically non-existent. Yet the figures prove that in neglecting it, the gas companies are ignoring the fastest growing segment of the domestic fuel and power consuming market.

The combination companies, those serving both gas and electricity, can afford, perhaps, to be somewhat complacent about this situation. Their simple reasoning is that they get the load anyhow — in one department or the other. But for the straight gas utilities to adopt this thought pattern is neither sound nor far-sighted. Every agency and every installation that furthers the use of electricity for cooking, water heating, refrigeration or house heating adds more bone and sinew to the strength of the competition that does not plan to confine itself to the rural trade.

And equally true is the fact that every gas installation, city or country, is one more nail driven into the coffin of the promotion of electricity for uneconomical uses.

A few years ago the gas companies could do nothing about the rural load; but that is far from the truth today. Developed outside of the gas industry, presented to it on a platter, so to speak, is liquefied petroleum gas, butane and propane, whose output volume has increased over a thousandfold in the past 17 years.

Whereas the cost of gas main extensions often precludes running service into sparsely-settled rural areas, no such limitations are imposed on the distribution of liquefied gas. It can go anywhere a tank or delivery truck can go. Particularly it recommends itself for territories adjacent to, but just outside, the economical distribution radius of piped gas.

Here is an outpost of future gas service extension; it can hold the ground against all comers, paying an adequate return on the small investment it requires, and safeguarding the future of the gas load from the encroachments of competing fuel. For gas men to ignore its possibilities is to ignore the future of their own business.

Good Within Reason

A recent dispatch from France appearing in the metropolitan papers stated that under German supervision all French shoes factories are to cut the costs of manufacturing women's shoes by standardizing on a single model hereafter.

An appended note to this news flash said that by standardization the cost of American shoes could be cut to an estimated one-sixteenth their present price.

Superficially, this sounds like a good idea. But like most ideas which are inherently sound the process of standardization can be easily overdone.

All of us would have missed most of the major pleasures of motoring if the automotive industry had been standardized on the 1917 Maxwell. And the American housewife would have missed the greatest single kitchen convenience if the United States had standardized on the 1890 model wood burning stove.

MICHIGAN CONSOLIDATED GAS COMPANY

Builds A High Pressure Main

(In Which Is Discussed the Design and Construction of (1) A Machine for Coating and Wrapping Large Size Pipe, and (2) A Tester for Main Joints)

THE increase in house heating and industrial gas consumption, particularly in the eastern area of Detroit, necessitated the installation of approximately 7 miles of 22 in. diameter, high pressure transmission main to reinforce the present transmission system radiating from the River Rouge natural gas receiving station. (See Fig. 1.)

Connection from the new main will be made to Stations "A," "B" and "H." These plants are distribution centers in the gas transmission system. The transmission mains from these plants are in general of a construction suitable for limited pressures, in most cases not to exceed 10 lbs.

The new 22-in. main across the city will transfer gas at 40 lbs. pressure and supply gas to three distribution centers through step-down regulators.

Another function which the new 22-in. main performs is to supply natural gas to the holders of Stations "A" and "B" for peak load and emergency use.

The capacity of the line is estimated at 2,500,000 cu. ft. per hour, of which about 500,000 cu. ft. will be delivered to Station "H," 1,000,000 cu. ft. to Station "A" and 1,000,000 cu. ft. to Station "B" for distribution to areas normally supplied through mains radiating from these plants.

The new main is made up of 20 and 40-ft. lengths of 22 in. O.D. electric welded steel pipe, with a wall thickness of 9/32 in. — weight per foot 65.22 lbs. — and a tensile strength of 60,000 lbs. per sq. in., with a working pressure of 255 lbs. and a safety factor of 4. There are several features in connection with the construction of this line which are of special interest.

The main is constructed with Dresser couplings using 5/8 x 1 3/16 in. Armored Gr. No. 27 gaskets, except on the joints at both sides of congested intersections, where special Dresser insulating couplings were used, consisting of a middle ring 1/2 x 8 in., enameled inside, with 5/16 in. pressed steel followers and special plain Grade No. 29 gaskets.

The insulating joints are provided to divide the line electrically to approximately 100 insulated sections to prevent stray railway currents from flowing on it. The route of the main passes through two major street railway substation districts and two minor ones. Potentials of various underground structures vary from a maximum of 14 volts to a minimum of 1 volt. While such potentials would not be harmful if the wrapping and coating of the pipe can be depended upon at all times to completely insulate it from the surrounding soil, electrical strains and stresses on the insulating material would tend to break down its insulating qualities in the event any moisture penetrated it.

With the line divided electrically into 100 insulated sections, each section will float in the potential field surrounding it and will not be subjected to large potential gradients.

In order to check the insulating qualities of both the wrapping and coating and the insulating joints themselves, test wires, heavily insulated No. 8 gage copper, were brazed to the main and run to terminal boxes in adjacent manholes. The electrical resistance of various sections can be readily obtained by means of the Wheatstone Bridge. In addition to these test wires, five pairs of current flow wires were brazed on the main adjacent to the railway substation. These wires will be used to determine if any current is flowing on the main. They consist of two wires connected to the main and spanning 30 ft. of straight pipe. These wires are run to terminal boxes similar to the test wires, and millivolt readings will be taken periodically as a check for current flow on the main.

Due to the importance of this line and to the hazards involved from the close proximity to other public utilities, such as electric and telephone duct systems, and adjacent large office and public buildings, it was decided to protect this main from corrosion and electrolysis by means of coating and wrapping. This protection consisted of a five-ply coating, a primer coat applied at the mill, a coat of hot No-Ox-Id wax material followed immediately with a wrapper and then a filler coat of No-Ox-Id material followed immediately with another wrapper — the wrapper consisting of tobacco cloth, impregnated asbestos felt, with No-Ox-Id and cellulose acetate dielectric membrane — all three sections coated and cemented together with No-Ox-Id.

The Dresser couplings and bolts were given a primer coat of No-Ox-Id by the manufacturer before shipment, and a second coat at the plant before delivery to the job. A third coat was applied to the couplings after installation on the pipe.

Coating and Wrapping Machine

THE determining factors* which prompted the development by Michigan Consolidated Gas Co. of a coating and wrapping machine to do this work at Detroit, were:

1. The saving in cost accruing over contracting the job to others.
2. Closer supervision over the operation of applying the coating and wrappers assures a well protected pipe.
3. The elimination of damage to the coating in handling to and from the railroad cars and in transit.

The machine, as finally built, consists of four major units. (See Fig. 2.)

1. The power unit for rotating and moving the pipe transversely.
2. The track upon which the power unit and pipe move.
3. The coating material tanks, including heating units, pumps, and nozzles for application of coating.
4. The wrapper reels which hold the wrapper and feed it to the pipe as the pipe rotates and moves past the reels.

In Fig. 1, the power unit (a) consists of a Ford V-8 engine (1) mounted at one end of a six-wheel carriage (2), driving through three Ford Model A transmission gear boxes (3), installed in tandem to obtain slow speed for movement along the track while coating; a Ford differential (4) with the spider gears locked so that both drive wheels receive equal and constant power, a chain driven, clutched, jack-

*Excerpts from a discussion on a machine for coating and wrapping large size steel pipe. This machine was designed and constructed by O. R. McGary and his associates in the Distribution Department of Michigan Consolidated Gas Company.

shaft (5) which transmits power to the rotating head (6) through a second chain drive. The sprockets for the chain drives, which transmit power to the jack-shaft from the main power shaft and from the jack-shaft to the rotating head, are of the correct size to turn the pipe through one revolution, 360°, while the carriage moves along the track a distance equal to the width of the wrapper, minus the wrapper overlap. The rotating head (6) fits inside the 22-in. pipe and holds the pipe securely by means of four large hex-headed set screws. A similar but free head (7) on a four-wheel dolly, supports the opposite end of the pipe.

The track (B) is approximately 115 ft. long, 26 in. high, and about 38 in. gage center to center of tracks. The long track is required to provide room at one end of the coating tanks for the power unit and the loading of a 40-ft. length of pipe from a rack parallel to, and adjacent to, the track, and for approximately 10 ft. of track over the coating tanks, and for about 45 ft. of track on the other side of the tanks to carry the pipe as it is pushed past the wrapper and coating nozzles at the tanks and for unloading the pipe onto a rack parallel and adjacent to the track. In effect, the track is set up across the ends of two racks of pipe, spaced approximately 15 ft. apart, one rack containing uncoated pipe and the other coated pipe as it comes from the machine. Both racks hold 30 lengths of pipe without stacking. The coated pipe is handled from the outlet rack to an adjacent stock pile where it is piled, supported on ends only, three lengths high. The coating material tanks are in the space between the two pipe racks and under the track.

The dimensions of the tanks (c) are approximately 3 ft. wide by 6 ft. long by 2 ft. deep. The long side of the tanks is at right angles to the length of the track. They are separated by a space of about 2 ft. Each tank is insulated and equipped with a recording thermometer in order to obtain satisfactory temperature control. Each tank is heated by three high pressure venturi mixers equipped with 1½-in. Stick-tite burners through immersion heating coils, which run horizontally through the length of the tank near the bottom and back across the tank nearer the top with vertical return bends. The coating material is applied at a temperature of 300° F.

One of the most bothersome problems was that of applying the coating materials to the pipe — not the pumping of the material to the nozzles—but the actual discharge of materials onto the pipe. The trouble was partially due to the original design not having the material control valves on the side from which the wrapper was being applied, partially due to the method of controlling the flow of materials and, in a minor degree, to stoppage in the pipes loading to the nozzles and in the nozzles proper. The whole difficulty was overcome by a re-arrangement of the piping so that hot coating material continually circulates through a manifold (8) adjacent to the nozzles (9). Flow from the manifold to the nozzles is controlled by a valve. When material is not being applied to the pipe, the nozzles are swung away from the pipe and the coating material emerging from the nozzles is returned to the tank through a separate line. This arrangement has worked very well.

The wrapper reels (D) are of fairly simple construction. The carriage which holds a roll of wrapper is mounted on the rear of a small table. The table is pivoted on the bottom to a substantial base which is held securely in a fixed position. The table may then be turned at any desired angle to the pipe and locked in position. The shaft on which a roll of wrapper is mounted and securely fastened is equipped with a small adjustable braking mechanism so that the roll will not over-run the wrapper as the wrapper is being withdrawn from the roll. From the roll the wrapper is carried upward and across the top and to the front of the table where it passes between two rubber rollers, very similar in construction to a washing machine wringer, and thence to the under side of the pipe.

As stated above, the pipe is loaded

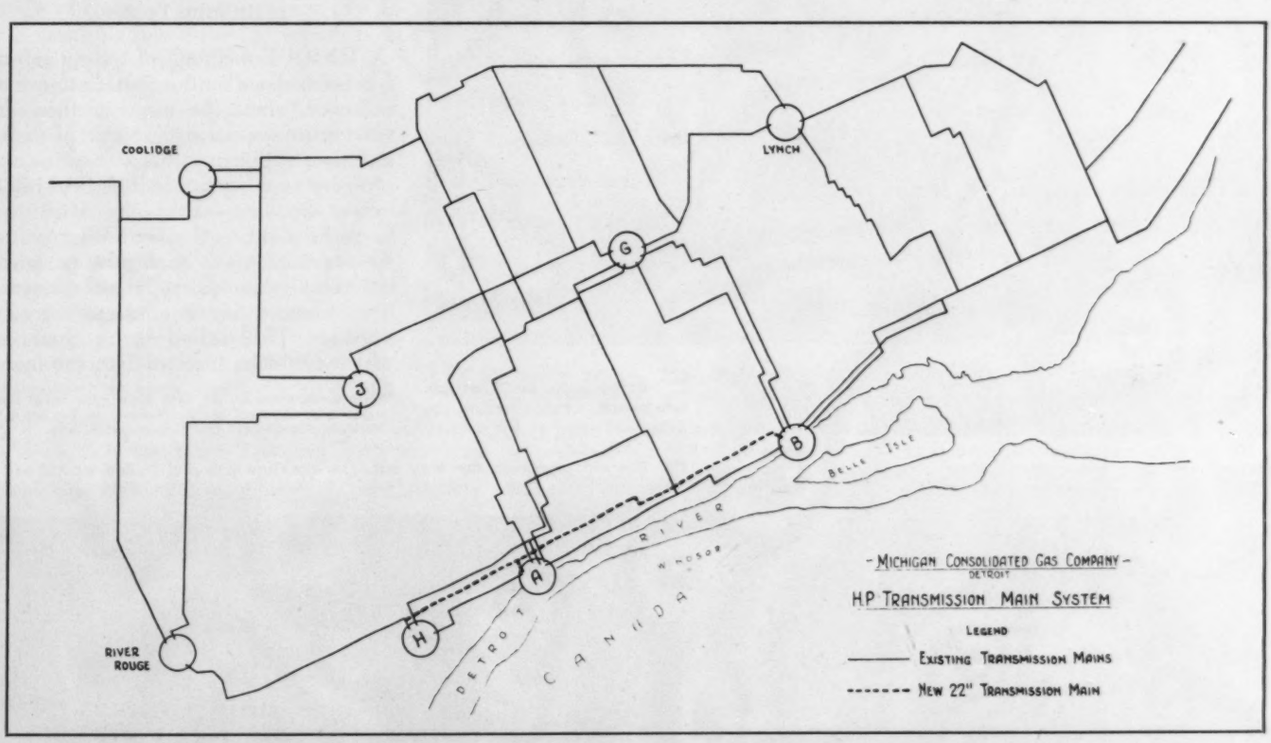


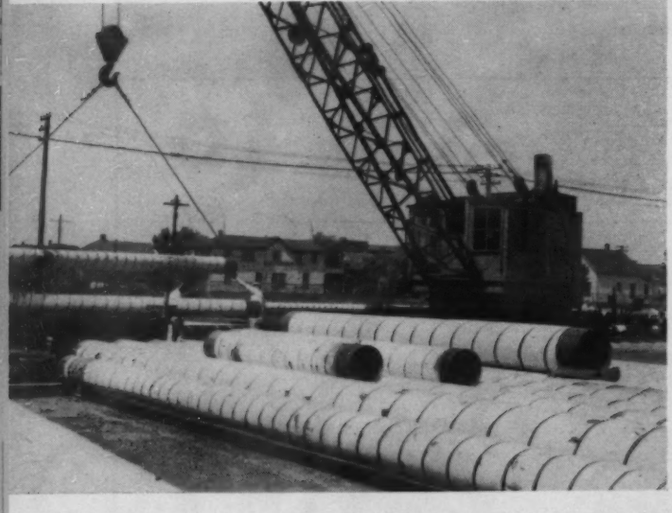
FIG. 1. Dotted line on the map shows the course of Michigan Consolidated Gas Co.'s new 22-in. high-pressure transmission main construction project. The circled-in points show holder stations. Natur al gas comes in at River Rouge plant.

1. The coating rig. Paper is being applied over the wrapper on the 22-in. steel pipe for the Michigan Consolidated Gas Co.'s new high pressure transmission main. Neil Schaberg (right front) in charge.

2. Conference. J. W. Batten, vice president and general manager; Henry Fink, assistant general manager; F. J. Hall, superintendent of streets, hold a conference on the job.

3. All wrapped up in their work. These men give the pipe a filler coat and wrapper.

4. Application of filler coat and wrapper. The machine turning the pipe is handled by man in rear.



5. Going up to the front line trench. Crane loading the wrapped pipe at Station H.

The bosses visit the job and O. K. the various steps as Michigan Consolidated Gas Co. builds a high pressure line.

into the machine from a rack at one end of the track and unloaded onto a rack at the other end. Each rack is of such a height that the pipe may easily be rolled from the rack into position above the centerline of the track for inserting the rotating and free heads which turn and support the pipe while it is being wrapped and coated. The pipe is rolled from the rack into position on two supports made of 2½-in pipe which slide back out of the way after the pipe has been locked on the heads. At the unloading end, after the pipe has been uncoupled from the heads, one man can roll a 40-ft. length out of the machine and onto the rack containing the coated and wrapped pipe.

Main Joint Tester

A UNIQUE method* of testing joints for leakage on this installation was followed, since the usual method of valving or stoppering a section of main and then subjecting this section to air pressure was not feasible. A joint tester was devised by the Michigan Consolidated Gas Co. for testing joints on large size pipe. Each joint is tested individually immediately after assembly by subjecting it alone to the test pressure. This called for a chamber which could be inserted into the open

*From a discussion on the Fink main joint tester constructed by members of the Distribution Department, Michigan Consolidated Gas Company.

6. Backhoe excavating and loading (below). Removing 16-in. pipe from the trench. The new steel pipe will occupy the same trench bed.

7. The old pipe's on the way out. The backhoe has just pulled up partial length of smaller diameter pipe. It rests on a skid before removal.

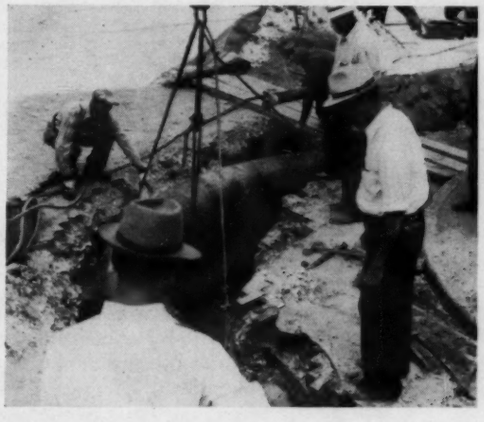
8. The new pipe arrives. Truck and trailer transporting pipe at one point on the line, stringing the 22-in. pipe along the trench for installation.

9. It's up in the air. Making ready to lower a 90° pipe bend into the trench. Fred Lerew, in charge, is shown in the right foreground.

end of the pipe and pushed into place inside the joint and then filled with air to 100 lbs. pressure.

The tester consists of a 24-in. length of 16-in. steel tubing used for the chassis on which the rubber tubes, etc., are mounted. The rubber tubes (1), see Fig. 2, are mounted in 5-in. wide reinforced rectangular channels around the circumference of the 16-in. steel tube,, 2 in. from each end, forming an annular chamber (2) between the two rubber tubes that is approximately 10 in. wide and about 2⅝ in. deep. The tubes are approximately rectangular in shape, 5 in. across and about 2⅝ in. deep. The valve stems (3) of the rubber tubes are on the side and the tubes are mounted so the stems protrude through holes on the inner side of the channels into the chamber between the tubes. The valve stems of the two tubes are connected by copper tubing (4) to the main air manifold (5) which is a ¾-in. pipe through the axis of the 16-in. steel tube chassis. The annular test chamber is also supplied from this manifold through a separate line (6) containing an orifice which is considerably smaller than the lines to the rubber tubes. Thus the pressure in the tubes builds up more rapidly than in the chamber, allowing the tubes to seal the chamber before the pressure in the chamber reaches 100 lbs. maximum.

The ¾-in. air manifold through the axis of the 16-in. steel tube chassis is supported at each end by a steel bar



10. Take it easy, boys. Safely guiding the pipe into the proper position, the crew lowers the bend.

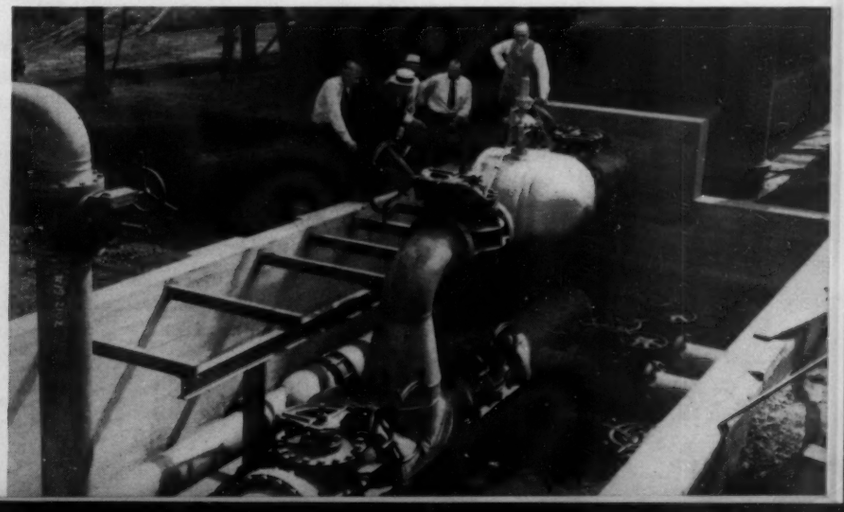
11. And safely down. The bend will very soon be placed in its final resting place.

12. An inside job. A crew coats coupling ring and bolts, another step in gas pipe line construction.

13. An outside job. Field coating a Dresser coupling.

14. The final test. John Curry (at right) and helper in the trench remove Fink Joint Tester from pipe.

15. Executive inspection. L. P. Richey, distribution supt.; Henry Fink, F. J. Hall, and J. W. Batten with F. L. Woolfenden, pressure supt., inspecting Station B regulator house.



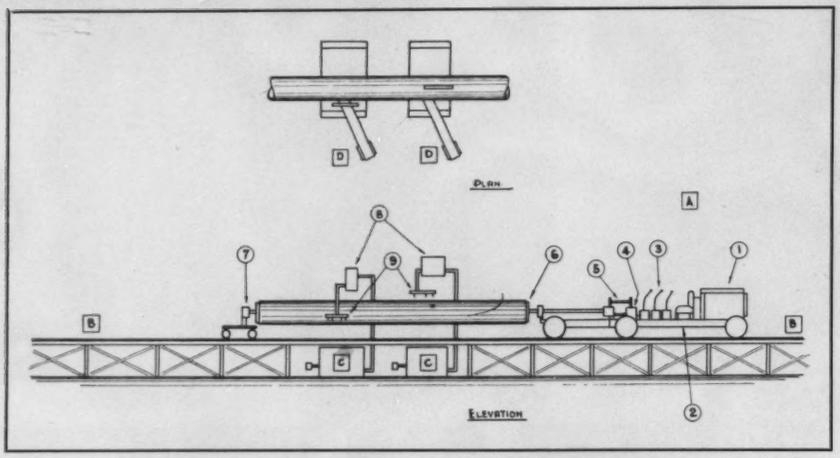


FIG. 2. Rig for coating and wrapping 22-in. steel pipe.

welded across the open ends of the tube. Coupled to this manifold is a piece of ¾-in. pipe of such a length that the distance from the center of the test chamber to the end of the ¾-in. pipe is 10 ft. Two additional lengths of ¾-in. pipe, one 10 and the other 20 ft. long, are supplied with the tester so that the tester may be used on varying lengths of 22-in. pipe up to 40 ft., without too long a length of ¾-in. pipe extending from the open end of the 22-in. pipe.

The tester is supported and moves inside the 22-in. pipe on four small steel wheels (7) which allow a clearance of about 1/32 in. between the bottom of the pipe and the channels which confine the rubber tubes.

In actual practice the tester is used as follows:

(a) First, assume that the tester is in position inside the main under the last joint tested, with the ¾-in. pipe connection to the tester extending to the open end of the last length of 22 in. pipe installed.

(b) As the next length of pipe is brought into position for coupling, a fitter in the ditch at the end of the last length laid takes hold of the ¾ in. pipe to the tester, inserts it in the end of the length being brought into place, and hand over hand pulls the tester to within a foot or two of the open end of the last length laid, at the same time pushing the ¾-in. pipe through the length being installed.

(c) After the new length is jointed and coupled, a fitter reaches into the open end of the main, takes hold of the ¾-in. pipe and pulls the tester into position under the new joint. Accurately measured marks on the ¾-in. pipe insure correct location of the tester.

(d) A pressure gage and air line to a compressor is then connected to the ¾-in. pipe. The rubber tubes and test chamber fill with air to 100 lbs. pressure very rapidly.

(e) While this pressure is maintained in the test chamber the Dresser coupling is thoroughly checked with soap suds for any evidence of leaks.

For testing the joints on 22°, 45°, and 90° bends it was necessary to make a somewhat different sort of tester. (See Fig. 3.) This tester consists of a single rubber tube mounted in a reinforced rectangular channel around the circumference of a short piece of 16-in. steel pipe and supplied with an air connection and wheels similar to the other tester. The shortness of this tester, about 8 in. in length, allows it to be pushed or pulled through all fittings. The application of this tester differs from the other in that the tube is centered and inflated directly under the joint being tested while another air line supplies air through a hole tapped from the outside in the middle ring of the Dresser coupling, to the seal space between the coupling gaskets, middle ring, pipe and inflated tester. Soap suds applied to coupling test for leaks.

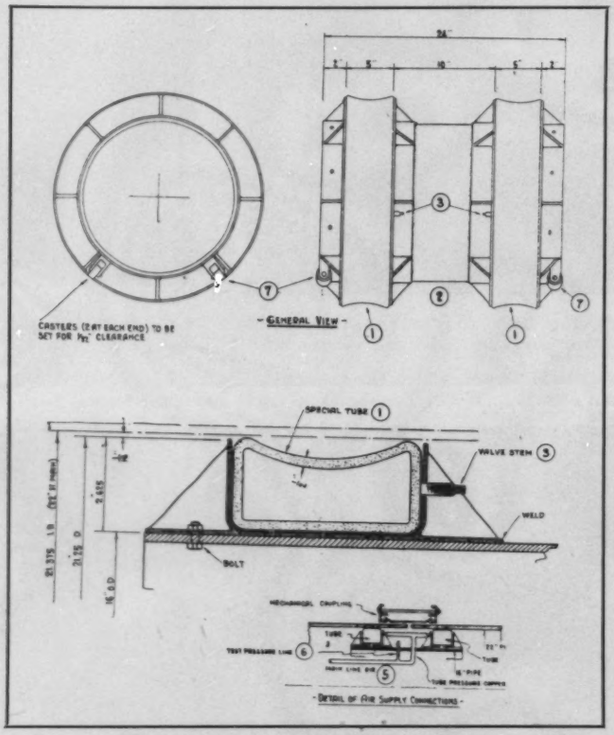


FIG. 3. Double tube — 22-in. joint testing equipment.

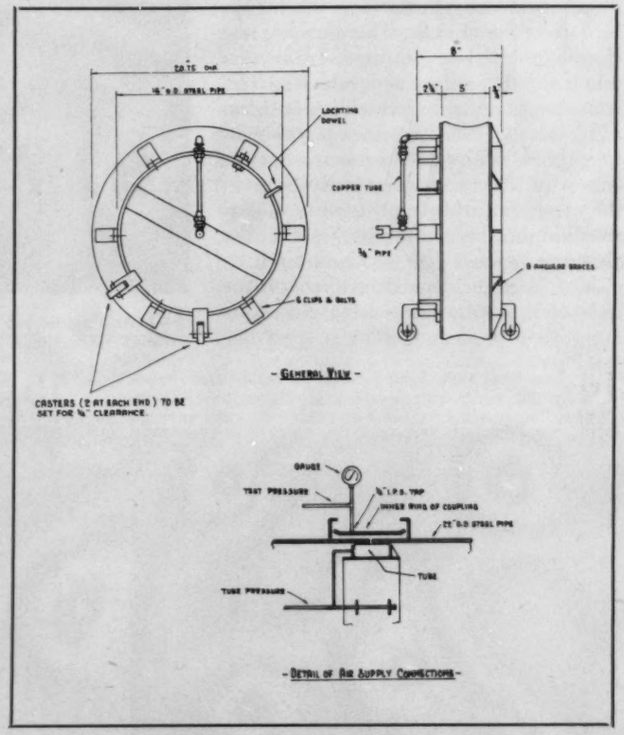


Fig. 4. Single tube — 22-in. joint testing equipment.

X-Ray Photography

Its Value in Pipe Line Operation

By R. RICHARDSON

Osborn and Nelson Company*

INDUSTRIAL X-RAY apparatus has been in use by industry for some time for the detection of flaws in metal castings and welds, including welded pipe joints. The X-Ray can also be used to measure metal thickness by comparison of color intensity with simultaneously photographed thickness standards. The resulting photographs furnish a reliable interpretation and permanent record of the metal structure and continuity, with the added advantage that the test is non-destructive. The extension of industrial X-Ray to the examination of welds and corroded areas in installed pipe lines would seem to offer obvious advantages, but its use has heretofore been retarded by the lack of portable apparatus and related technique. Development along these lines has now progressd to the point of practical application, as described in two papers, "Application of X-Ray to Pipe Lines," by R. RICHARDSON, Osborn and Nelson Co., and "X-Ray Examination of Pipe Joint Welds," by W. M. HENDERSON, Southern California Gas Co. Both papers are to be presented before the Technical Section of the Pacific Coast Gas Association at the 47th Annual Convention, Hotel Del Coronado, Coronado Beach, Calif., September 19, 1940. — (Abstracts by G A S.)

IT IS not generally known that the first use to which the X-rays were put was in photographing metal objects. Possibly Prof. Roentgen, the discoverer, visualized such a use for his rays. Although these primitive pictures showed the interior structure of the articles X-rayed, nevertheless very little progress was made in applying X-rays to other fields than medicine until in recent years.

Present needs in many fields are constantly finding new uses for these remarkable waves of radiant energy. Uses not thought possible but a short time ago are developing with the advancement of the art.

When it is understood that here is a means capable of showing the finest detail in the heart of a rose, yet has the power to reveal flaws in a weld in steel of massive thickness, it becomes an instrument of many possible uses. But this requires a thorough comprehension of the factors which go to make a good X-ray picture. These are three in number (although several minor requirements must also be adhered to more definitely than in any other type of photography):

The Major Factor

The first and major factor in getting good results is the variation of the high voltage input to the X-ray tube. Probably more than any other factor, the improper adjustment of the kilovoltage setting has been the cause of poor quality industrial X-ray pictures.

Secondly, next in importance—more than in photography—is the exposure time.

Third, the quantity output of X-rays from the X-ray tube is a variable, dependent upon the type of tube, method of rectification and need for speed in production. Likewise, a tube to film distance is a variable, having a direct bearing on the quality of results.

Not that an average good X-ray picture cannot be taken on a general exposure technique, but to secure the greatest detail on the X-ray film requires much patient individual investigation and some knowledge of X-ray fundamentals. This is said in defense of the art, since it is often passed by because of previous poor results with the X-rays.

It has been asked often, What are X-rays?

X-rays are a form of energy, like visible light, that travel at the same speed as light, and that obey many of the laws of visible light. In one respect, however, they are strikingly different: Due to their much shorter wave-length, they are transmitted through materials opaque to visible light penetration. The wave-length of the average X-rays is about one ten-thousandth that of visible light.

The manner in which X-rays are generated is a very complex physical process and need be treated, here, only in an elementary way. The high voltage necessary for the generation of the X-rays is obtained, usually through a specially wound transformer immersed in an oil-filled tank. For the heavier portable jobs, such as X-raying of welds in pipe lines and pressure vessels, a transformer is used of 150,000 peak-volt capacity. This is fed 220 volts of alternating current generated by a gasoline driven motor-generator set of approximately three K.W. output.

On jobs that are hard to get to it is necessary to use a transformer such as can be transported by hand. This type of transformer can deliver sufficient output required for this work, from a 110 volt A. C. supply; so a smaller generator can be used.

A gasoline driven generator that is small enough to mount on a low-bed trailer, and that can be wheeled across plowed fields or through growing crops in order to reach the location in the pipe line, has been developed.

The two types of X-ray outfits operate through two distinct electrical principles: The large transformer, of 150,000 volts, feeds the high voltage to a mechanical rectifier, which, rotating at the same speeds as the alternations of the supply current, is in step with the frequency of the high voltage and delivers to the X-ray tube the crests or peak voltage, only, as a one-direction pulsation D. C. current. This enables a much greater voltage to be impressed on the X-ray tube that can be fed from the self-rectifying principle of the small transformer portable outfit.

Portable Transformer

The portable transformer works on the self-rectifying principle, in that the X-ray tube acts as a valve rectifier and suppresses one-half of each sine or wave form.

In either case the high voltage is the means of speeding the electrons emitted from the hot, electrically heated, wire of the cathode of the X-ray tube on their way to the anode of the tube.

Since X-rays are produced when electrons, traveling at high speed, collide with matter in any form, the anode of the X-ray tube is also the target on which these high speed electrons collide. X-rays are produced on that spot.

Modern X-ray equipment control

*Portions of a paper, "Application of X-Ray to Pipe Lines," to be presented before the Pacific Coast Gas Association's Annual Convention, September 19, 1940.

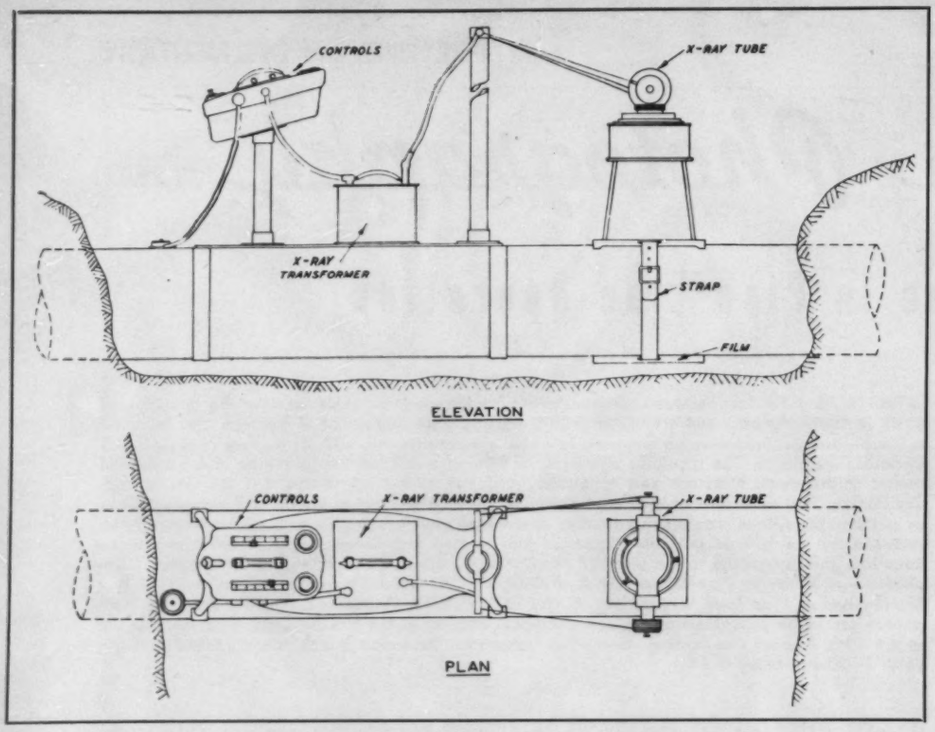


FIG. 1. Diagrammatic layout of X-Ray apparatus.

is so finely regulated that very fine graduation of X-ray output can be achieved.

As regards the exposures required, that is a variable based on the diameter of the pipe, the wall thickness of the pipe, the distance of the X-ray tube from film, and method of rectification used. We find that, generally, the time required to place the tube and expose the picture does not exceed 10 minutes.

The film for taking an X-ray is put into a lead backed holder, in very much the same way as one would place an ordinary photo film in the dark room. The holder is then placed on that side and portion of the pipe line which is selected for test and held in place by means of the strap. The X-ray tube is mounted on the opposite side of the pipe in such a way that the straight line path of X-rays penetrates the two-wall-thicknesses of the pipe and exposes the film to their action. And, since the intensity of ray penetration through thinned out parts of pipe, such as defective welds or due either to erosive action of liquid water or the presence of deep pits, is greater than through the normal wall thickness, the defective areas of the weld or pipe appears much darker on the exograph than do the parts with normal wall thickness. The relative intensity of the darkened area thus would represent the relative depth of corrosion penetration.

The application of X-ray to pipe line maintenance was demonstrated recently on two pipe line problems.

The first job involved the X-ray of the full circumference of a number of designated welds along a portion of a 16-in. line of the Southern California Gas Co. This job is described by W. M. Henderson in a paper appearing on page 29 of this issue.

The other problem was a search for internal corrosion on a cross-country pipe line of the Southern Counties Gas Co. This job required an X-ray apparatus which could be transported across fields, over fences, down gullies, and on the opposite side of the railroad tracks from the source of power. This was accomplished by compact but powerful X-ray equipment which, knocked down and packed into four or five suitcase-like cases, could easily be lifted over fences and carried moderate distances. This equipment was assembled into an operating set-up. Fig. 1 shows a diagramatic layout and Fig. 2 an assembly on the pipe line.

The problem of bringing the electrical current to the X-ray transformer was solved by mounting a compact gasoline motor-generator on a special low-bed trailer, hitched to an enclosed body truck, which served as a mobile darkroom for the convenient developing of the X-ray negatives, right at the job.

When the excavated holes, of approximately 5 ft. in diameter, exposing the pipe line, were located in excess of 200 ft, from the highway, the trailer, with the generators, was detached from the truck and wheeled into the field between the rows of growing crops and brought within the length of our 200-ft. rubber-covered stage cables. Additional lengths of cable would allow for further distance between the generator and the X-ray transformer.

On this job a new technique was used to record the difference in depths of the cavities in the wall of the pipe, for it was desired to segregate and show such erosion as might materially affect the serviceability of the pipe. This technique was devised by X-raying the penetrometer, or depth gage, on the same film as the picture of each section of pipe examined—by a double exposure! Consequently, when read on a densitometer, or light-recording instrument, the degree of greyness of any area of the X-ray negative could be interpreted by a reading from the known depth of steel on the penetrometer.

Based on the actual field experience, the application of the X-ray to the study of internal conditions along a pipe line has possibilities. It offers a nondestructive method of testing. Its use is new on pipe line work, and has not entirely emerged from the role of experimentation. The fact that the X-ray will penetrate metal of heavy wall and show differences in density is demonstration that it can be applied to the problem involved with respect to porosity of welds or internal corrosion on pressure vessels or pipe lines.

It offers economic advantages in inspection work which justify its application and development.

FIG. 2. The X-Ray apparatus assembled in the pipe line.

The X-RAY EXAMINATION of Pipe Joint Welds

By W. M. HENDERSON

Southern California Gas Company*

THE Southern California Gas Co. maintains along a portion of a roadway under improvement, about 9,000 feet of 16-in. diameter high pressure gas main — a part of the trunk line supplying Alhambra and San Gabriel Cities and the adjacent area.

This pipe line was originally laid in March, 1922, with all-welded joints, and a protective coating of asphalt and a burlap wrapper. The location, with respect to the original roadway, was in the shoulder a few feet off the curb.

The State highway design for the new road provided for realignment, establishing a set-back of property-lines and straightening of off-sets existing in the old road. This new design established the 16-in. gas line under the concrete portion of the proposed new road at various locations.

Expense Involved

It was the suggestion of the State Highway Department that the main be removed and reinstalled in the utility strip outside the new curb line. To do this involved considerable expense as well as dispensing with the service of the line during the period of relocation. The Highway Department was agreeable to leaving the line in place on condition that no street openings would be requested or granted during the service life of the pipe; that is, the line was to be abandoned in place if, in the future, any repair or maintenance work was found to be necessary.

Therefore, the physical condition of the pipe line was the determining factor as to what action should be taken with respect to leaving it in place or relocating.

A soil survey was made, along the route of the pipe line, with a Shepard rod, and by soil samples it was hoped to determine maximum corrosivity of the soil. Along the entire length the index registered a mild soil of very low conductivity. As a check, openings were made at selected locations, and the pipe wall examined. The pipe protective coating was brittle and disintegrated, but the pipe metal was at all points found to be as sound as when originally laid, without evidence of any corrosion or pitting. Pipe lines in this type of soil apparently had infinite service life.

Internal corrosion was not considered to be a factor, as the line has always operated with relatively dry gas free from condensation.

The problem remaining, on which evidence was desired before making a decision, was the strength of the pipe joint welds. As the line had been in service 18 years and during that time but two weld leaks had developed on the section of line, including the portion within the road improvement, this was considered important.

The joint welds constituted a doubtful factor, as, under present-day standards, the technique and practice of 18 years ago are not considered as contributing to high quality welding. Inspection of the surface of the weld was not sufficient; the fact that all welds were built up was considered as a favorable sign, as any slag or oxidation formed in the welding process would be on the surface and, therefore, leave clean metal in the weld between the parent metal of the pipe. The strength of the weld and the degree of penetration could only be determined by actual test and inspection.

It was necessary at a few locations along the line of pipe to make cuts, in order to install new connections, plug valves, and lower sections. This procedure offered opportunity to cut coupons from the welds and test for tensile strength. However, it was intended that this work would be done as required, and only if the pipe was to be left at its original location. What was desired, to complete the survey of the line, was a means of determining the quality of the welds and to secure this record while the line continued in service.

The metal X-ray offered a possible solution — at least it would show the density of the weld metal and disclose any inclusions and lack of penetration.

Arrangements were made with the Osborn and Nelson Portable X-Ray Co., who operate a portable apparatus for industrial work, and a number of welds were exposed along the line at points where lowering of the pipe was anticipated, if the line was to be left in place. These offered a suitable opportunity to determine what disclosures could be secured by the use of X-ray. (See Figs. 1 and 2.)

It required about 12 hours to secure the exposures on 25 welds. Because of the size of the pipe, four pictures were taken to complete the circumference of each weld, and this required less than eight minutes per picture. (See Figs. 3 to 8.)

Results Satisfactory

The results of these photographs were very satisfactory and, in some respects, most interesting. The film is easily read. Along the edge of the negative the pipe wall shows, and this may be considered as a reference to which all other disclosures are to be compared. Thus, any film effects darker than the pipe exposure are evidence of less thickness than the pipe wall, and the converse if the effect is lighter — it indicates that the metal is thicker than the pipe.

Many of the films showed a prominent streak down the center of the weld, lighter on one side than on the other. It was not until some of these joints were later cut that an explanation was apparent. The wall thickness of the pipe lengths varied—some were .28 in., others .31 in. — and wherever these sizes were joined it registered on the film. All welds showed considerable excess metal, even if inclusions or lack of penetration was evident.

By reference to the pictures reproduced from the original X-ray film it is possible to detect the pipe contact at various points, by a fine dark or black line. This indicates lack of complete penetration at these points. Any variation in weld thickness is disclosed, as, for instance, in the picture the ripples in the welds are clearly shown. All black spots, or lines, are voids, or inclusions, and the lighter the negative by comparison the greater the density or mass of metal.

The value in an X-ray exposure is

*Portions of a paper, "X-Ray Examination of Pipe Joint Welds," to be presented before the Pacific Coast Gas Association's Annual Convention, September 19, 1940.

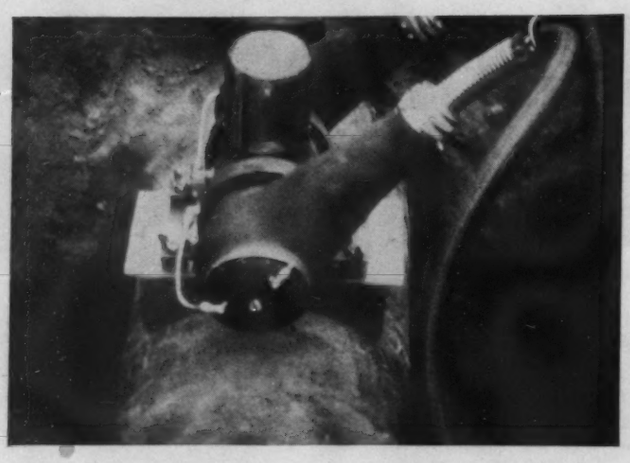


FIG. 1. X-Ray set-up on pipe joint for taking picture of bottom section of weld joint. Note small size of portable X-Ray machine.

FIG. 2. X-Ray setup on side of pipe for photographing opposite side. Under strap, at operator's hand, is lead plate with film.

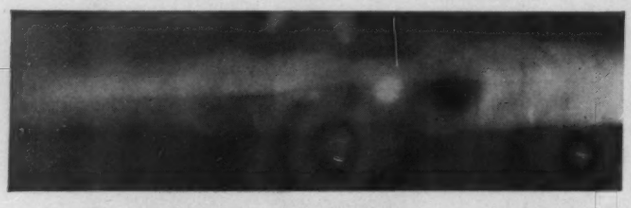


FIG. 3. A section of a 16-in. weld. The black spot shows a point lacking penetration, also faint line of pipe ends covered by built-up weld.

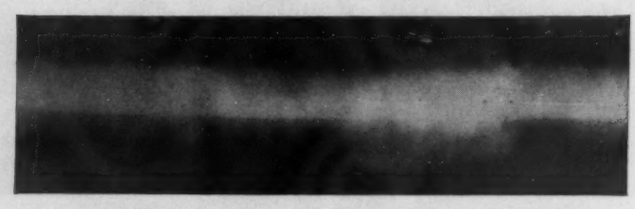


FIG. 4. A section of a good 16-in. weld. Difference in shadowing due to build-up of weld on right, account of difference in thickness of pipe wall.

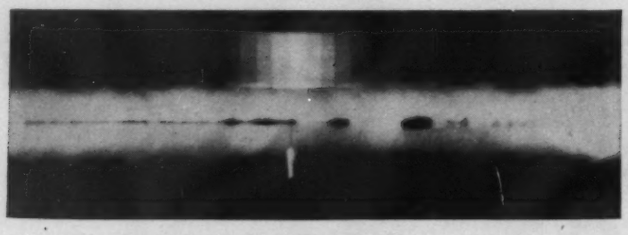


FIG. 5. A sample of acetylene weld, made in shop, to illustrate a lack of penetration.

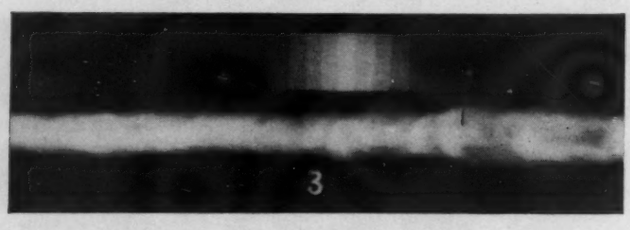


FIG. 6. A sample of acetylene "Speed Weld," made in shop. This shows full penetration.

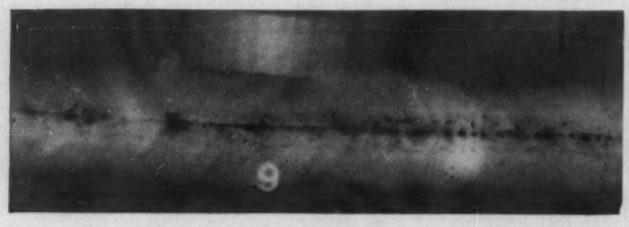


FIG. 7. A sample Arc-weld, made in shop. Slag inclusions.

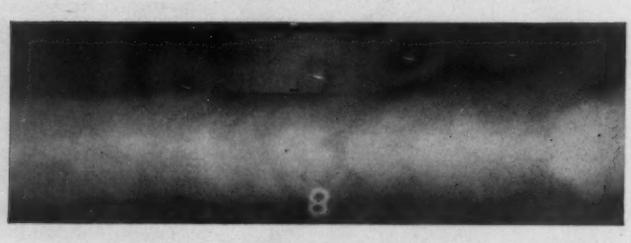


FIG. 8. A sample Arc-weld, made in shop. Full penetration.

to have a standard for comparison so as to completely interpret the disclosures. This can be done by introducing into each picture a piece of metal varying in thickness by known degrees. Then, each tint on the negatives can be compared with the key to determine the actual thickness of metal.

Whenever it was necessary to cut the pipe for lowering, the welded joints were cut out, and some of these had been exposed for X-ray. So, from the X-ray negative points were selected and these matched with the actual weld. Coupons then were cut at selected parts of the weld for pull tests in the tensile machine. Selections were made at doubtful parts of the weld, as well as those which showed what appeared to be good welding. The results supported the disclosures. Good welds pulled, outside the weld, in the pipe stock at 48,000 lbs. per sq. in., and over. Some coupons pulled from 35,000 to 40,000 lbs. per sq. in. The portion of a weld which appeared to be poor, pulled as a coupon as low as 31,000 pounds. This low was considered well above the maximum stress that would be experienced on the line if left in place.

As a result of the investigation, and the disclosures made by the X-ray, it was evident that the pipe line should remain in its original location.

1500-Mile Line May Bring Texas Gas to New York

THE Reserve Gas Pipe Line Co., Dallas, Texas, has filed with the Federal Power Commission an application for a certificate of public convenience and necessity authorizing the construction and operation of a natural gas pipe line system extending a distance of 1500 miles from Texas into the State of New York. Natural gas thus transported would be sold at wholesale to distributing companies serving markets in the Philadelphia, New Jersey and New York City areas. The line will cost about $80,000,000.

The proposed line is to be a 24-in. main transmission line operating at approximately 1000 lbs. per sq. in. pressure. Plans also call for the construction of two 10,000-hp. compressor stations on the south end of the line and 11 compressor stations of 9000 hp.

From the point of origin, near the Texas-Louisiana State line, the proposed pipe line would extend through the states of Louisiana, Mississippi, Alabama, Georgia, South Carolina, North Carolina, Virginia, Maryland, Pennsylvania and New Jersey, and into New York, the application states.

The company proposes to finance the construction of the pipe line and other facilities, including compressor stations, "through the issuance and sale, either public or private, of such securities as may be requisite in a manner and in such amounts as may hereafter be determined." Full details of such proposed financing will be furnished to the commission, it is stated. As reasons for granting the certificate applied for, the applicant states, among other things, that the construction of the proposed facilities will materially aid in carrying forward the program of national defense; that for the first time the vast natural gas reserves of the state of Texas will be available to heavily populated areas on the Atlantic seaboard, and that ultimate consumers will be enabled to purchase natural gas at rates lower than those prevailing for existing gas service in the territory to be served.

J. Wallace Bostic, president of the Reserve Gas Pipe Line Co., said that arrangements had been made with Glore Forgan and Co. to finance the main pipe line, and that the company has set up offices in Dallas.

The source of supply, it is stated, will be the Gulf Coast region of the state of Texas in which region the Reserve Gas Pipe Line Co. asserts it has commitments covering a supply in excess of 4,500,000,000,000 cu. ft. of natural gas, and believes that this source has a proven and developed supply of 17,750,000,000,000 cu. ft. not now utilized.

The application states that the supply is contained in a number of separate and distinct pools, and is not confined to a single gas pool. It is expected that the gas upon delivery at the Atlantic seaboard will have a 900-B. t. u. heating value.

The company's studies of New Jersey, New York and Pennsylvania markets indicate that its population exceeds 14,500,000 persons, and contains not less than 3,500,000 consumers of manufactured gas. Some conception of the potentialities of the northeastern market can be gained from the most recent data available on customers, sales and revenues of the manufactured gas industry. In May the manufactured gas industry served the three states of New Jersey, New York, and Pennsylvania as follows: Total customers, 4,546,997; total sales (M c.f.), 12,935,605; total revenue, $13,366,531.

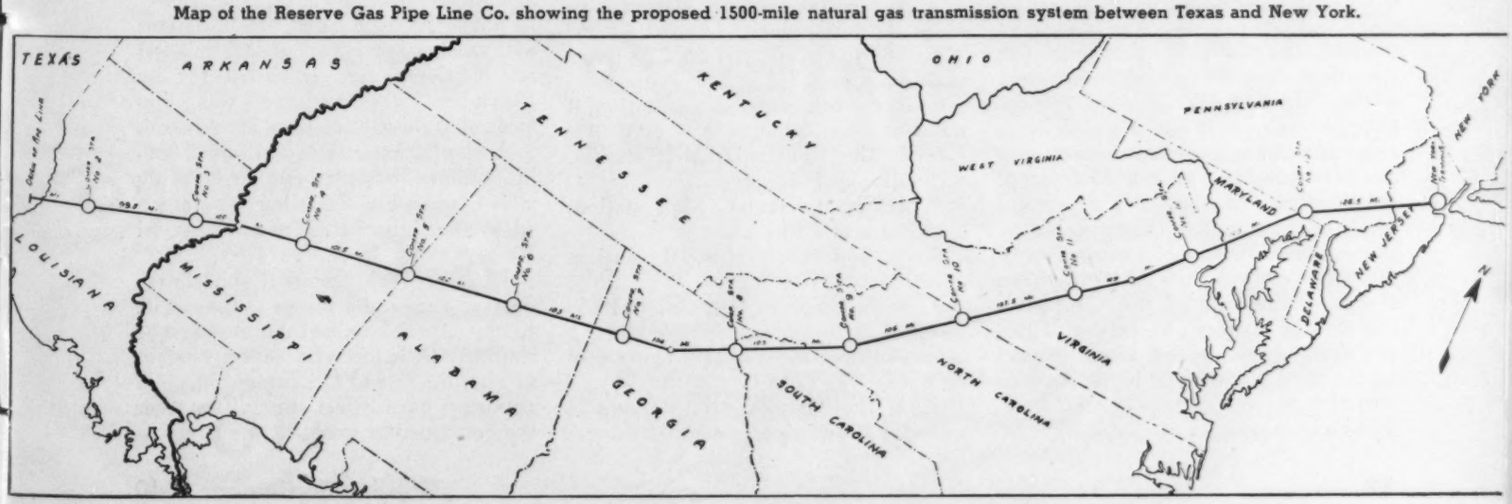
Approximately 75% of these manufactured gas consumers in these states will be served with natural gas. Applying the 75% ratio, there would appear to be a potential demand for 9,701,703,750 cu.ft. of natural gas per month.

The potential revenue cannot be safely projected from that accruing to the manufactured gas industry, since the Reserve Gas Pipe Line Co. bases its certificate application partially on the plea that fuel costs would be lowered. The 3,500,000 potential customers in that area would be nearly half as many as the total consumers of natural gas reported in the May statistical summary of the A. G. A. (*GAS*, August, 1940, page 42.)

Since the northeastern cities which would be served by the new line are highly industrialized, the volume of natural gas required to supply the demand may be considerably higher than the proportion of customers would indicate. This hypothesis is supported by the fact that less than ½ of 1% of the total natural gas customers in May were industrial accounts and yet consumed almost half of the total sales for that month.

The pipe line company does not propose to sell natural gas from its pipe line system at retail, but proposes to sell gas only to gas distribution companies for their own use and for resale for ultimate public consumption for domestic, commercial, industrial or other uses, and to sell surplus gas to industrial consumers for their own consumption. Rate schedules and forms of contract for the sale of natural gas by applicant to its customers, whether for resale or otherwise, have not been finally determined, but applicant will furnish to the A. P. C. complete data on all rates proposed to be charged.

Map of the Reserve Gas Pipe Line Co. showing the proposed 1500-mile natural gas transmission system between Texas and New York.



Snapped in the office of J. C. Reinbold, in conference on Panhandle Eastern Pipe Line Co.'s latest construction program — George T. Koch, superintendent of compressor stations; S. A. Taylor, purchasing agent; Fay Walters, superintendent of gas measurement, and J. C. Reinbold, general superintendent.

Panhandle Eastern Pipe Line Co. Pushes Work on Another Loop Line Project

PANHANDLE Eastern Pipe Line Co., Kansas City, Mo., is currently working on what it terms its No. 2 project for 1940 which consists of the construction of 106.5 miles of 24-in. and 20-in. gas transmission loop line along its facilities between the Texas Panhandle and the Illinois-Indiana state line, at which point the Panhandle Eastern system connects with the facilities of the Michigan Gas Transmission Corp., which delivers the Texas gas to the City of Detroit.

The present construction project is a continuation of Panhandle Eastern's loop line expansion program which dates back to 1936, when the company's compressor horsepower was tripled by the addition of 29,300 hp. through the construction of seven new compressor stations. In that year also an absorption gasoline plant and a gas dehyration unit were built, and two submerged crossings of the Mississippi River were completed. The second phase of the company's expansion took place in 1937 with the construction of 290 miles of loop lines springing from the discharge side of the company's compressor stations. In July of 1940, the company completed the first part of the third phase of its loop line construction project, and the current activity is a continuation of that work.

The new construction work will enable Panhandle Eastern to increase its delivery capacity 25 to 30 million cu. ft. per day, thereby meeting the growing demand of its largest single customer, the Michigan Consolidated Gas Co. of Detroit, and the increased requirements of the cities and towns of Kansas, Missouri and Illinois receiving service. (*GAS*, May, 1940, pp. 38-39).

The present construction project of the Panhandle Eastern Co. includes:

1. At Liberal, Kan., compressor station, 7.5 miles of 24-in. pipe.
2. At Greensburg, Kan., station, 8 miles of 24-in. pipe.
3. At the Haven, Kan., station 8.25 miles of 24-in. pipe.
4. At Olpe, Kan., station 8.25 miles of 24-in. pipe.
5. At the Louisburg, Kan., station, 8 miles of 24-in. pipe.
6. At the Houstonia, Mo., station, 6.75 miles of 24-in. pipe.
7. At the Centralia, Mo., station, 6.25 miles of 24-in. pipe.
8. At the Pleasant Hill, Ill., station, 13 miles of 24-in. pipe.
9. At the Glenarm, Ill., station, 16.50 miles of 24-in. pipe.

In addition, there is also being constructed:

1. At the Tuscola, Ill., station, 24 miles of 20-in. pipe.

National Tube Seamless pipe, Barrett enamel, Crane valves, and Dayton couplings of National Supply Co. are going into the project. Truman Smith Contracting Co., Eldorado, Kan., is constructing the line from the Liberal, Greensburg, Haven, Olpe, Louisburg, Houstonia, and Centralia plants, while I. C. Little, Dallas contractor, has the Pleasant Hill, Glenarm, and Tuscola portions. The line is of composite construction with Dayton couplings being installed approximately every 80 ft. Construction is expected to be completed by October 15.

The 1940 No. 2 project also includes considerable construction work at various of the compressor plants. A 1300-hp. Cooper-Bessemer engine is being installed at the Sneed, Kan., compressor, giving it a total of four units of 5200-hp. A diethylene glycol plant is also being built there. By this, gas between the Sneed and Liberal stations, a distance of 160 miles, will be dehydrated. Fluor Construction Corp. has the contract for this plant. Construction was begun about the middle of August, and will be completed by December 1.

A complete new compressor station got under way about August 15 in block 1, section 13, Hanford county, Texas. Six 650-hp. angle type units will go into this station. A permanent operations camp including a house for the chief engineer and six houses for operators are being provided at the site. There a 75,000-gal. elevated, steel water tank will be erected, and a Cooper-Bessemer direct connected auxiliary unit will be installed. The cooling towers will be Fluor-made, as also will be the air-cooled mufflers for the motors.

At Liberal, Kan., the existing calcium chloride dehydration plant is being converted over to one for diethylene drycol dehydration, but with an increase in capacity at the same time that circulation and distillation capacity is also being added to accommodate 350 million cu. ft. capacity per 24 hours. At the present time the plant will treat a maximum of 260 million cu. ft. Completion is called for by December 15. Construction was commenced at this station right after July 4.

At the Glenarm, Ill., station a 1000-hp. Cooper-Bessemer engine is being added, and a Fluor cooling tower erected by the Robert H. McKee Co. of El Paso.

J. C. Reinbold, general superintendent of Panhandle Eastern; George T. Koch, superintendent of compressor stations; D. K. Stevens, superintendent of pipe lines; and J. S. Stevenson, chief engineer, have direct supervision over the construction work.

Natural Gas Pipe Line Co. Plans 100-Mile Project

THE Natural Gas Pipe Line Co. of America, Chicago, Ill., recently announced plans for the construction of 100 miles of 20-in. pipe line from the company's trunk line compressor station at Geneseo, Ill., to the vicinity of Belvedere, 60 miles from Milwaukee, Wis. The line will be coated throughout and wrapped with kraft paper.

This is the first half of a program to serve natural gas to Northern Illinois and Wisconsin markets. The second part is the construction of new pipe line facilities extending into the Texas Panhandle and Hugoton fields.

According to company reports, the new construction will bring gas from Kansas, Oklahoma and Texas, and will double the existing facilities and serve markets in Illinois, Wisconsin, and other midwest and eastern states.

Although construction has been contemplated since 1932, when the 24-in. main line from the Texas Panhandle to Chicago was built, work has just been started and will be completed in approximately 150 days.

The contract has been let to Kelly Dempsey Co., Tulsa, Okla., with Loy Wilson, a partner on the job, as supervisor. J. L. Works is the superintendent. Headquarters will be established at Geneseo, Ill., and will be moved later to Rockville, Ill.

It was stated that the Natural Gas Pipe Line Co. of America needs no permit from the FPC because the new markets are not now being served with natural gas.

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New Mexico Gas Company Increases Line Capacity

THE New Mexico Gas Co., Santa Fe, N. M., which serves Santa Fe, Albuquerque, Farmington and Belen, N. M., has constructed 9-miles of 8-in. hot enameled and felt-wrapped pipe parallel to a portion of the present 25-mile, 6-in. line between the Kutz Canyon and Ute Dome fields in San Juan County, N. M. Cost is estimated at $80,000, according to J. C. Reid, of the engineering department.

Additional work being done by the New Mexico Gas Co. includes installation of aftercoolers, enlarging the cooling tower on the Kutz Canyon compressor, increasing capacity of dehydrators, enlarging gathering lines at Kutz Canyon from 4-in. to 6-in., and replacing two miles of the 4-in. main line to Farmington, N. M., with wrapped pipe.

The Fredell Construction Co. is doing the work with Van Thompson, Southern Union Service Co., supervising.

■ ■

Lone Star Gas Co. Starts Fort Worth Extension

Construction of a 9-mile main line extension bringing natural gas service to 500 homes in Castelberry Gardens, northwest of Fort Worth, Texas, will soon be completed, according to F. L. Carmichall, manager of the Fort Worth division, Lone Star Gas Co., Dallas, Texas.

Mr. Carmichall announced that this is the largest district outside of the city limits to receive natural gas service in several years. The new extension is one of several planned by the company to serve the fastest growing areas adjacent to the city.

Engineering surveys have been completed, and the work is going forward under the supervision of Wade Page, superintendent of distribution, and W. R. Bennett, assistant for the Fort Worth division.

Columbia Gas Subsidiaries Begin Work On 100-Mile West Virginia-New York Line

PRELIMINARY work on the second 100-mile steel pipe line for natural gas transmission to be constructed in the past few years was begun July 25 by the Manufacturers Light & Heat Co., Manufacturers Gas Co., and Pennsylvania Fuel Supply Co., all of Pittsburgh and all affiliated interests of Columbia Gas & Electric Corp. of New York. Work will be completed in approximately three months at a cost of about $1,800,000. About 2,500,000 cu. ft. of natural gas will be carried annually.

Connecting near Monaca, Pa., with a pipe line from the Western Virginia gas fields, the new line will extend through Western Pennsylvania to the New York State line at Knapp Creek.

Recent reduced production from the Oriskany sand in Tioga county that originally supplied the requirements of 50,000 commercial and domestic consumers in Binghamton, Johnson City, Endicott, Olean, Myack, Port Jervis, Goshen and Middletown in New York State made necessary the new construction. The total mileage of the line will break down into approximately 12 miles of 16-in. O.D., 6 miles of 12-in. I.D., 26 miles of 10-in. I.D., and 56 miles of 8-in. I.D., all Dresser coupled. Original joints on the river crossings will be welded with Dresser repair sleeves added to give additional protection and weight.

The contract has been let to Williams Brothers Corp. of Tulsa, Okla.

Pacific Gas & Electric Co. Plans Line Construction

NEGOTIATIONS are under way between the Standard Oil Co. of California and cific Gas & Electric Co., San Francisco, Calif., for the commercial development of a new gas field near Woodland, Calif. The Standard Oil Co. has substantial acreage in the Fairfield Knolls field about 8 miles southwest of Woodland, where it has brought in two wells.

Subject to approval by the California Railroad Commission, the P. G. & E. proposes to build a new pipe line to hook up with the existing Davis-Woodland line. Eight miles of pipe will be laid and regulators and odorizers installed at a cost of approximately $41,400, and the gas will be used to supplement the supply in the Davis-Woodland region which is now being served by the Rio Vista field,

The Pacific Gas & Electric Co., San Francisco, Calif., has applied to the California Railroad Commission for permission to construct a 20-mile gas transmission line from its new field at Rio Vista to connect with its main line to Sacramento, Calif. The estimated cost is approximately $418,000. Of the new line, 17.8 miles will be of 12¾-in. pipe and 1.9 miles of 6⅝-in. pipe.

The company also seeks to substitute natural gas for butane to 200 consumers at Isleton, Calif., upon completion of the new line.

The Pacific Gas & Electric Co. will also begin work on an extension of the gas main north of Lodi, Calif., which will be slightly over six miles long and will involve an expenditure of approximately $29,000.

■ ■

Arkansas Towns to Have Gas Service By November

LOUISIANA-Nevada Transit Co., Dallas, Texas, of which T. R. Jones is president, has secured authority from the Arkansas Utilities Commission to pipe natural gas to Taylor, in Columbia County, Bradley, in LaFayette County and Fulton, McNab and Saratoga in Hempstead County in Arkansas. The commission issued the order August 5.

Approximately 300 tons of Republic Grade B pipe will be used in the extension program, the laterals of which originate at the main carrier of Louisiana-Nevada extending from the Cotton Valley, Louisiana, field to Okay and Hope, Ark. There are 92 miles of 8-in. transmission line also of Republic Steel Pipe in the original development, including the extension of the line to Hope, at which point various industries, including the Hope Brick Works, are being served. T. R. Jones Contracting Co. of Dallas constructed the original line and will also construct the new line.

The towns, all in Southwest Arkansas will receive the gas by November 1 with construction work having already started on the laterals. W. A. Delaney, Jr., is chairman of the board of Louisiana-Nevada Transit Co., and M. O. Matthews is treasurer. W. Mike Murphy is operating manager. Field offices are located at Hope and at Cotton Valley. Martin Gehling is superintendent of the Arkansas division and Charles Perkins of the Louisiana division.

■ ■

Sheridan and Buffalo, Wyo. Get Gas From New Fields

Sheridan and Buffalo, Wyo., started receiving natural gas from Fremont county through the new Casper-Billy Creek $500,000, 100-mile line August 18. The line was recently built to deliver gas, purchased by the Northern Pipe Line Co. from the Northern Utilities Co., near Casper, to the Montana-Dakota Utilities Co. at the Billy Creek field south of Buffalo, in order to augment the gas supply for Sheridan and Buffalo, it is reported.

At Casper, the new line connects with existing lines which run 100 miles west to the Muskrat and Sand Draw fields in Fremont county. Those fields are now supplying Casper, Douglas and neighboring towns and the Billy Creek field is being held only as an emergency. The pipe line recently built consists of 65 miles of 6-in. and 35 miles of 4-in. line and is operated at 600 lbs. pressure.

GAS PROCESSING

With Propane Refrigeration In the Presence of Diethylene Glycol

By J. C. ALBRIGHT

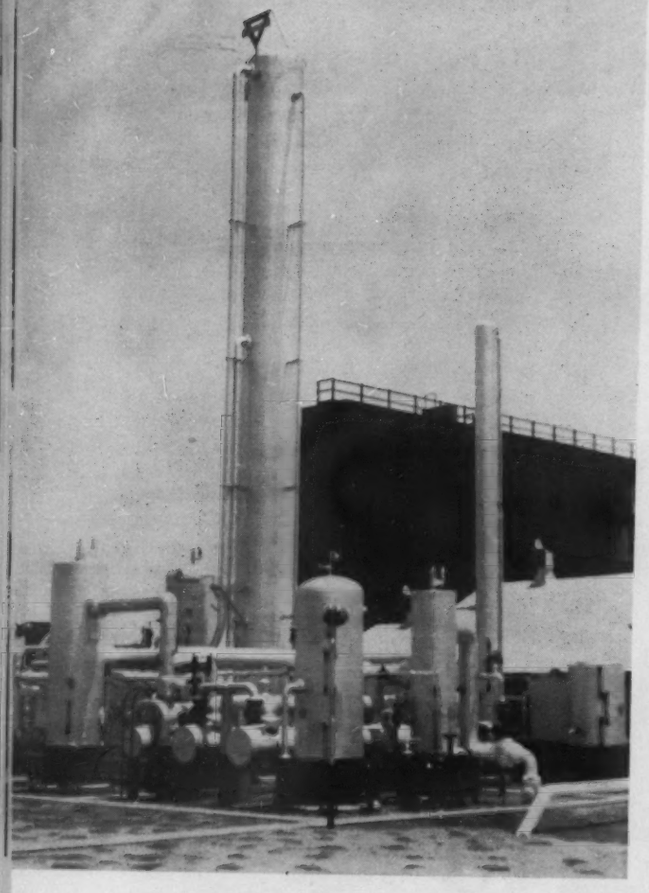


FIG. 1.

At Continental Oil Co.'s propane refrigeration and diethylene glycol dehydration plant in Wichita County, Texas. The largest tower is the de-ethanizing column. Small tower at right is the diethylene glycol concentration still fractionator.

CONTINENTAL Oil Co. has recently placed in operation a new type of gas processing plant, designed throughout by Stearns-Roger Manufacturing Co., who handled all details of fabrication and field construction. This plant is a departure from the usual type of field processing plants in that propane is utilized to reduce the temperature of the gas and condensate to a uniform temperature of 0° F. throughout the processing cycle. Diethylene glycol is introduced with the commodity, traveling with it until the products have been separated.

Two problems were solved when this plant was placed in operation. The first concerned the increased production of available hydrocarbons present in the gas, and the second, that of removing all water from both the gas and the product. Disposition of the dehydrated gas is linked with one of the largest gas repressuring projects to be started in the United States. Pressures upwards to 1750 lbs. gage are encountered at gas injection wells, and at these pressures hydrate formation completely shuts off delivery of the gas to the field. This difficulty was eliminated after this new plant was placed in operation, as the gas dew point at 1750 lbs. gage pressure is only 8° F.

The gas produced with the oil from flowing and pumping wells in the greater K-M-A oil field contains large quantities of propane and the butanes, each valuable as separate products or when mixed together for use in varied industrial and domestic applications. To obtain the greatest economical extraction of these hydrocarbons, the new plant was designed so that temperatures of 0° F. could be imposed and maintained on the gas and the condensate throughout the cycle of operation.

In this plant there is one principal unit where all products of refrigeration and compression are fractionated to remove ethane and lighter and to retain all propane and heavier. At a second plant the gas is processed with refrigeration and diethylene glycol, the liquefied hydrocarbons being pumped through a pipe line to the first plant for fractionating to required specifications. The capacity of these plants is about 40,000,000 std. cu. ft. of gas each 24 hours, which is handled in stages ranging from an intake pressure of 10 in., Hg. vacuum to a final pressure of 1750 lbs. per sq. in. gage. Fig. 1 gives a general view of this plant, and Fig. 2 shows compressor equipment.

Thirty-six hundred horsepower are available for operating both of these plants. At the main plant five 400-hp. Clark engines and one 800-hp. engine compressor are connected to the gathering system and to the pressure lines returning to the field which surrounds both plants. Similar engines are at the second plant, and operating conditions are similar at each unit. Steam is utilized for operating pumps in the fractionation section of the main plant, but gas is used for this purpose in the second plant, as reduced pressures are necessary for some operations and permit such practice.

In the refrigeration section of the main plant, shown in Fig. 3, the propane used for chilling is fractionated as a relative pure product and placed in a closed circuit for expansion to vapor and recompressed and liquefied again. In this and associated refrigeration circuits, there are provisions for a heat exchange of 3,855,000 B.t.u. per hour. To handle the refrigeration medium, two 200-hp. Clark gas engine-driven compressors are employed. The vapors are compressed through two stages and passed through atmospheric condensers to liquefy. The resultant condensate is accumulated in what is termed the propane surge tank, 48 in. O.D. by 10 ft. high, designed for a working pressure of 250 lbs. gage. A pilot-operated liquid level controller vents the liquefied propane from the surge tank to the propane flash tank from which the liquid flows to exchangers termed propane gas chiller where provisions are made for an exchange of about 1,362,000 B.t.u. per hour. This chiller is an exchanger which contains approximately 464 sq. ft. of surface. The propane, submerging the tubes in this exchanger, flashes to vapor and as such returns to the propane flash tank from which it is vented through a pilot back-pressure regulator to the compressors again.

Following the flow of gas through this newest type extraction and dehydration plant, it is picked up by low-pressure cylinders of the angle type engines at atmospheric to below atmospheric pressure, and boosted to a uniform pressure of 50 lbs. gage. The gas is passed through adequate atmospheric cooling sections, in a low wind loss cooling tower, and piped directly to a water separator where some of the moisture is removed. The gas is again picked up by the compressors where the pressure is increased to 300 lbs. gage. Liquids, both water and hydrocarbons, together with the gas, are passed to a separating vessel, 48 in. O.D. by 8 ft. in height, designed for 350 lbs. working pressure, where an interface level controller vents the condensed water to plant disposal lines.

Both the uncondensed gas and hydrocarbons that are liquefied at 300 lbs. gage pressure in atmospheric coolers, where the temperature averages about 90° F., are passed directly, without attempting separation of the two, through an 8-in. pipe line to the first contact of refrigeration. The unit employed for this exchange is a shell and tube unit containing 668 sq. ft. of surface, where an exchange of approximately 755,000 B.t.u. per hour is obtained. At the inlet of this heat exchanger, called the gas-to-gas exchanger, the concentrated diethylene glycol is introduced, employing a rate of about 3 gals. per minute.

The gas and liquids, hydrocarbon condensate and diethylene glycol, split at the outlet of the gas-to-gas exchanger, part flowing directly to the chilling units proper, and part passing to three vessel outlets to control the temperature of the commodity which is being processed. The split streams of the gas and condensate, together with the glycol, join again to enter a gasoline separating vessel, a tank 42 in. outside diameter and 12 ft. high, where the uncondensed gas, consisting principally of methane and ethane, is released through a pilot operated back pressure regulator and flows to the stripped gas system of the plant at a temperature of 0° F. to exchange with the gas, gasoline and glycol to obtain cooling of the commodity by direct exchange in the shell and tube unit at this point.

• GAS IN RECENT issues has published numerous articles on refrigeration, dehydration, gas injection or repressuring, and other current developments in the field processing of natural gas. The subjects of these articles are interestingly combined in Mr. Albright's study on this Continental Oil Co. plant. — Editor.

By passing through the various sections of the refrigeration unit the glycol absorbs the remaining water left in the gas and the gasoline, to provide a water dew point of 8° F. when the gas is again compressed, this time to 1750 lbs. The dilute glycol and the gasoline flow from the gas separator at 300 lbs. gage pressure through twin exchangers where the outlet temperature is controlled by a portion of the warmer gas and liquids passing from the gas-to-gas exchanger. The liquids then enter the first of three vent tanks, this one operating at about 135 lbs. gage pressure to release, at the process pressure and at 0° F., that part of the gases not liquified or those coming out of solution at the reduced temperature. The gases thus released consist principally of dissolved methane, and are passed to venting lines for further disposal. In succession, the liquids flow through the intermediate vent tank and into the glycol separator and low pressure vent tank. The intermediate vessel operates at about 50 lbs. gage pressure to release a further amount of dissolved gases, still largely consisting of methane, but containing some ethane and a small percentage of propane. Chilling is controlled at the outlet of this vessel by the split stream of gas and liquids as in the gas separator and the high pressure vent tank, so that the liquids remain at zero temperature. The system of venting is continued so that most of the methane is removed at the low pressure vent tank and glycol separator.

The low pressure vent tank and glycol separator is a vessel 12 ft. 6 in. outside diameter and 40 ft. in length, insulated to maintain the temperature of the commodity. Both the gasoline and the now very weak glycol enter at the same point, but a system of baffles and retarding weirs causes the gasoline to

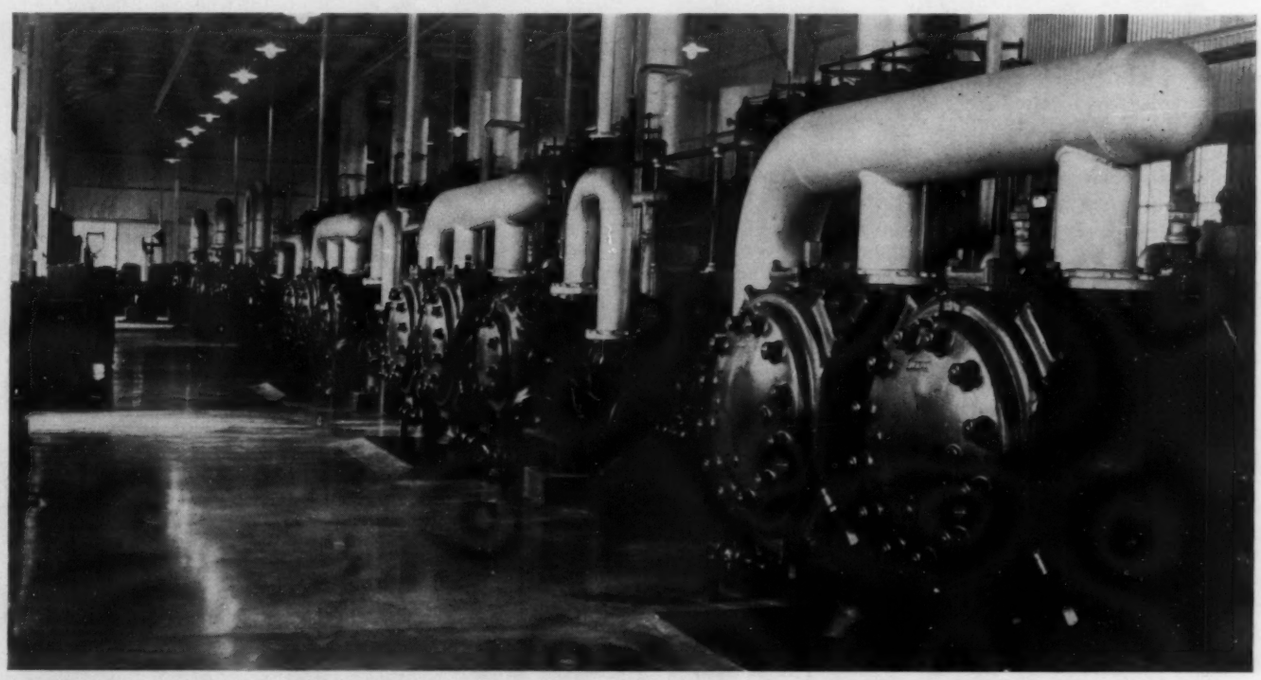


FIG. 2. Engines used to three-stage the gas from 10 in. Mercury vacuum to 1750 lbs. gage pressure.

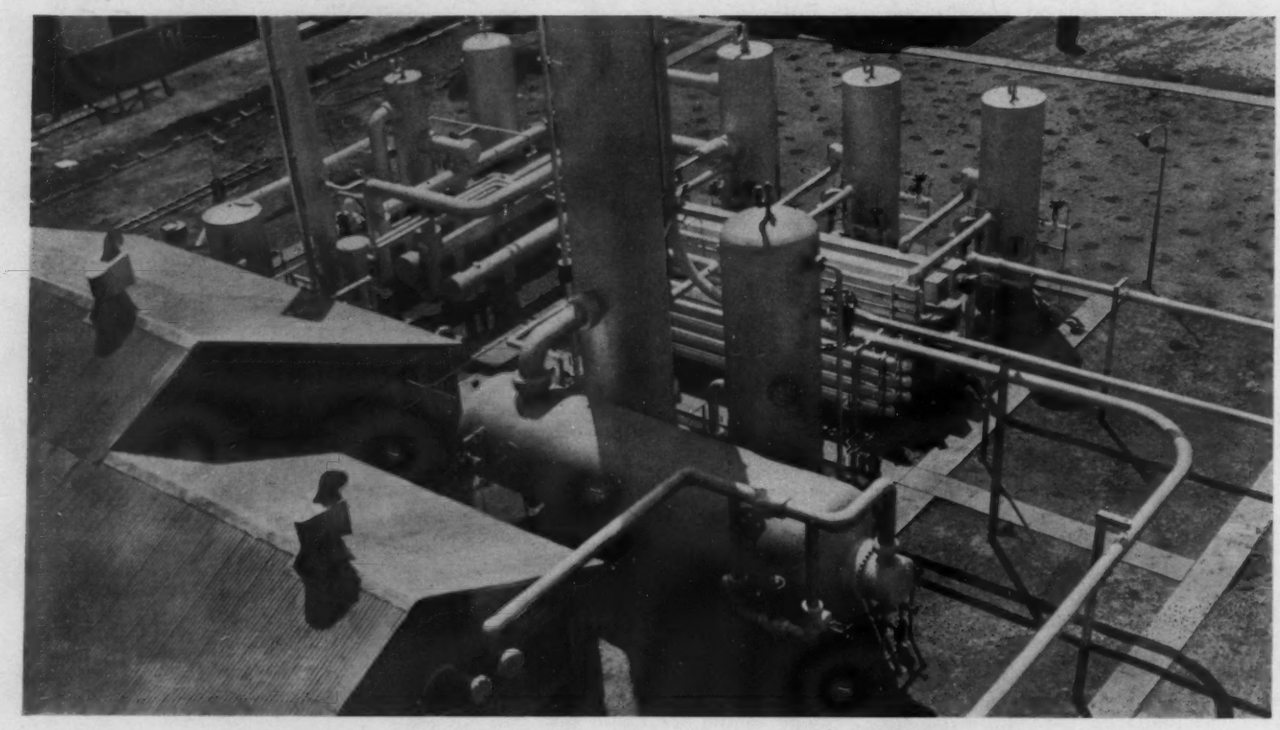


FIG. 3. A bird's-eye view of the refrigeration system, showing the diethylene glycol dehydration unit.

leave the tank at the topmost level, while the glycol is removed by an interface liquid level controller. Sufficient time is provided for the passage through this vessel that no glycol is indicated in the gasoline, and the interface level controller is so sensitive that no gasoline is observed in the dilute glycol.

The application of propane chilling has been used in connection with absorption oil in gasoline plants, but so far as is known, this method has not been used before in complete chilling of condensate and with the inclusion of diethylene glycol. The glycol, used principally in counter-flow towers for the dehydration of natural gas or removal of water from residue from gasoline plants, has a great affinity for water. The presence of glycol in association with certain percentages of water forms a solution which does not freeze at 0° F. The material is somewhat similar to a non-evaporating antifreeze used in automotive radiators, and has a wholesale price of about $1.50 per gal. Because of the high price, it is necessary to use extreme caution to prevent loss through leakage.

In this plant, the glycol is passed from the low pressure vent tank and glycol separator by the pressure within the tank to the glycol concentrating unit, or distillation apparatus. This unit consists of cold to hot exchangers, a still, 18 in. in diameter by 32 ft. high, a reboiler — 16 in. I.D. by 5 ft. 9½ in. long—and a glycol surge tank. (The reboiler is shown in Fig. 4.) The still is operated at about 275° F. and at a pressure of 10 lbs. gage, so that the water contained in the weak glycol will be evaporated. Rising to the top of this column, the water is refluxed with overhead condensate to prevent passage of glycol as an entrained liquid. Glycol leaves the base of the still and flows counter current through the exchangers, coolers and to the glycol surge tank. From this 48 in. by 6 ft. vessel the glycol is picked up by a reciprocating plunger pump and passed back to the point where it first entered, to complete the cycle.

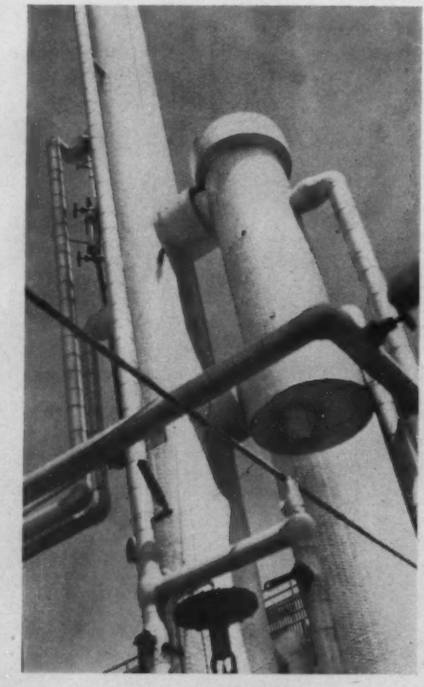


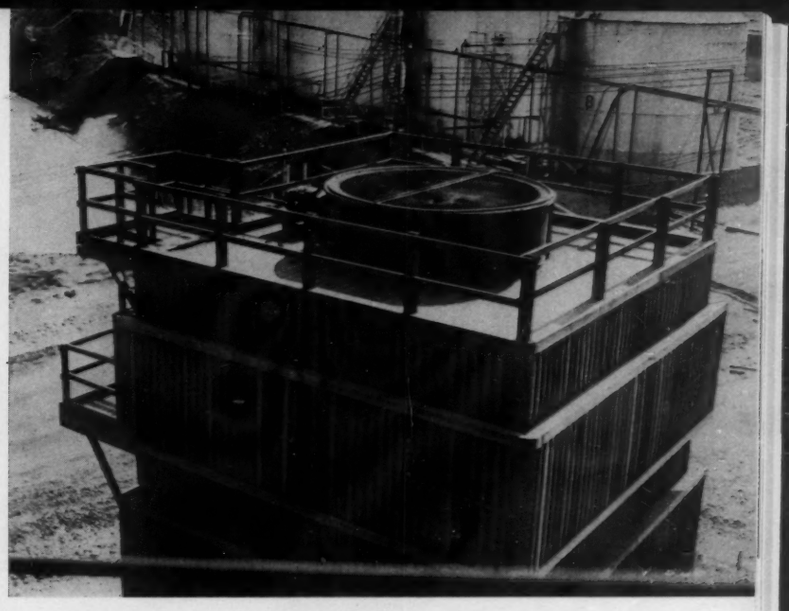
FIG. 4. Reboiler of diethylene glycol concentration still at Continental Oil Co.'s new plant.

The hydrocarbon condensate from the main plant, plus that produced at the second field processing unit is fractionated to specifications in a section of the main plant, designed specifically to handle large quantities and to remove the ethane without permitting any of the heavier fractions to be lost. Gasoline from the glycol separator enters a tank of like dimensions and capacity with the gasoline produced at the other plant, from which it is pumped to the stabilizer. This vessel is a tower 60 in. O.D. and 61 ft. high having a reboiler 72 in. O.D. by 20 ft. long, equipped with heating coils, water withdrawal level controllers and is insulated so that the operation will be more uniform.

The residue gas, which has been processed with refrigeration in intimate contact with diethylene glycol, is recompressed in the third stage to 1750 lbs. gage, and piped throughout this vast field to be introduced back into the producing zone to maintain the reservoir pressure.

COOLING TOWER
SELECTION AND PERFORMANCE

By HUGH R. LAMBERTH
The Fluor Corp., Ltd.



Induced draft tower in refinery service.

• **COOLING TOWER DESIGN has shown great improvement during the last decade, particularly in the case of the mechanical draft types. Attention has been given to greater efficiency of performance and to conservation of space, which latter is of obvious importance when one considers the large number of towers scattered throughout oil fields and industrial districts and even on roof tops in congested areas. Some of the aspects of design and performance are covered in a paper, "Some Practical Aspects of Water Cooling Tower Selection and Performance," by HUGH R. LAMBERTH, Fluor Corp., Ltd., Los Angeles. This paper will be presented before the Technical Section of the Pacific Coast Gas Association at the 47th Annual Convention at the Hotel Del Coronado, Coronado Beach, Calif., September 19, 1940. — (Abstract by G A S.)**

THE purpose of this paper is to discuss practical aspects affecting selection, application and performance of atmospheric deck type towers and mechanical draft towers and to stress the importance of basic data on which cooling performance is determined.

The conventional, practical, and economical method of cooling large quantities of heated water in order that it can be recirculated is to distribute it over an atmospheric deck type tower where it is uniformly broken up and filmed over fixed surfaces exposed to natural air currents, or through a mechanical draft tower where the film surfaces are exposed to air movement created by mechanically driven fans.

Practically all of the heat dissipated is accounted for by evaporation of a portion of the circulating water. The sensible heat loss by conduction, convection, and radiation is relatively small.

The rate of evaporation from a free water surface is controlled primarily by:

1. The vapor tension of the water corresponding to its temperature.
2. The vapor tension of the moisture in the air corresponding to its absolute moisture content or dew point temperature.
3. The effective velocity of air over the water surface.

For problems, other than those requiring relatively small temperature drop in the water and wide approach to the wet bulb temperature, sufficient surface exposure can not be provided by spray breakup alone. It is necessary to provide fixed surface so arranged that the water is broken up at continuous short intervals and time of contact with the air prolonged. This is accomplished by decks or grids arranged from top to bottom of the tower in such a fashion as to provide a maximum of effective water surface exposed to air currents.

The first essential to selecting a cooling tower is to determine the total amount of heat to be dissipated, then to determine the temperature of cold water desired, bearing in mind that the wet bulb is the ultimate limit of evaporative cooling. After these two controlling factors are determined it is then necessary to fix the maximum temperature that can be used or the quantity of water to be circulated, as determination of either of these fixes the other.

I should like to make a general observation at this point to the effect that in any given problem the selection of cooling tower, heat exchange equipment, pumps, piping, and appurtenant power costs should be considered as a unit and each item evaluated in its relation to the integrated whole. An apparent gain in one direction can be overbalanced by a loss in another part of the equipment which is often undetected when considered separately.

For example, the following table shows the general effect of variables involved in the size, and hence first cost, of an atmospheric deck type tower.

For a constant heat load:

More Tower Required

1. High water circulation — low temperature.
2. Low design wet bulb.
3. Close approach to any wet bulb.
4. Low wind velocity.
5. Relatively low height.

Less Tower Required

1. Low water circulation — high temperature range.
2. High design wet bulb.
3. Wide approach to any wet bulb.
4. High wind velocity.
5. Relatively high height.

To be more specific, assume a problem in which it is desired to dissipate 10,000,000 B.t.u. per hour. The nature and arrangement of heat exchange equipment, and temperature limitations of individual equipment will determine the water circulation and temperature range of circulating water to be used.

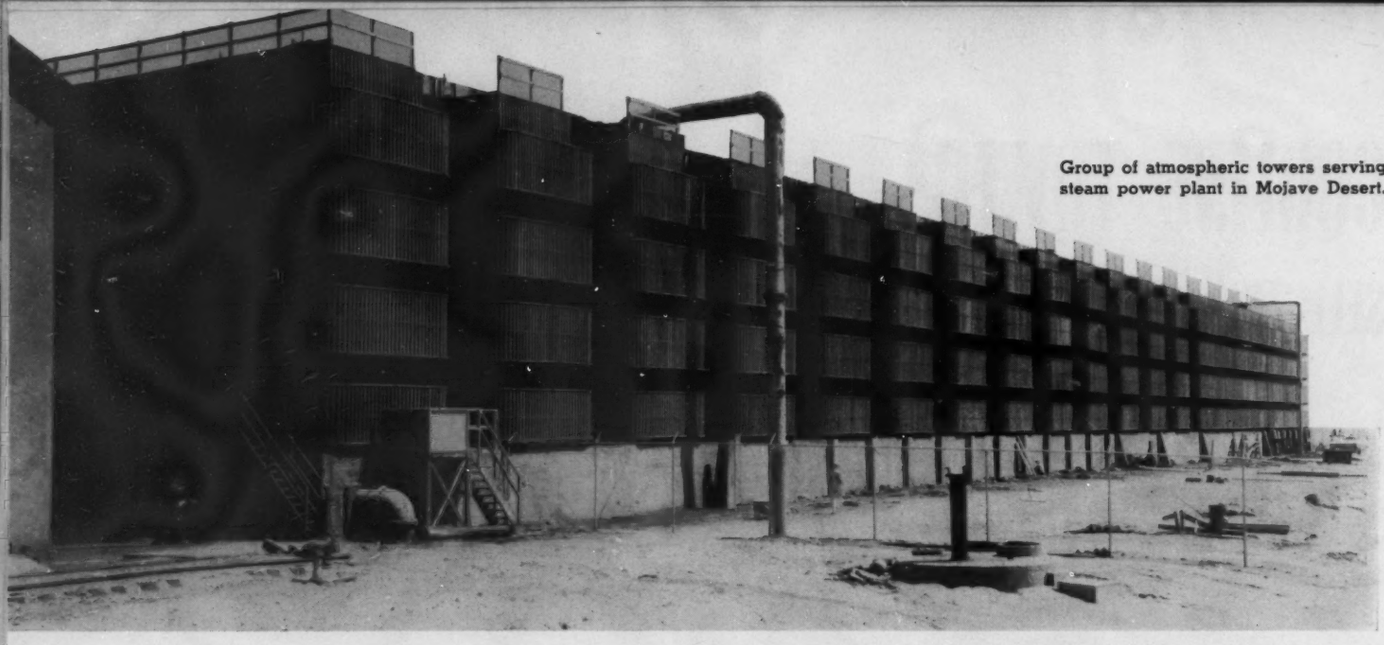
Referring to the table above:

1a. A 10° F. cooling range would require a water circulation rate of 2000 GPM which for a 12 ft. wide by 35 ft. high deck type tower would require a relative length of 1.00.

1b. A 25° F. cooling range would require a water circulation rate of 800 GPM which for the same tower would require a relative length of only 0.72.

2. Assuming at 25° F. cooling range and a 5° F. approach to wet bulb temperature, then with all other conditions constant, a design wet bulb temperature of:

(a) 60° F. would require a relative tower length of 1.00.
(b) 70° F. would require a relative tower length of 0.76.
(c) 80° F. would require a relative tower length of 0.65.



Group of atmospheric towers serving steam power plant in Mojave Desert.

3. Assuming a 25° F. cooling range, a 70° wet bulb temperature and with all other conditions constant an approach to the wet bulb temperature of:

(a) 2° F. would require a relative tower length of 1.00.
(b) 5° F. would require a relative tower length of 0.68.
(c) 10° F. would require a relative tower length of 0.42.

4. With a 25° F. cooling range and all other conditions constant a wind velocity of:

(a) 2 miles per hr. would require a relative tower length of 1.00.
(b) 5 miles per hr. would require a relative tower length of 0.72.
(c) 10 miles per hr. would require a relative tower length of 0.54.

5. Assuming a well designed 12 ft. wide deck type tower, with decks on approximately 3 feet centers, a height of:

(a) 28 ft. would require a relative length of 1.00.
(b) 36 ft. would require a relative length of 0.75.
(c) 44 ft. would require a relative length of 0.58.

It is obvious from the above that a selection of reasonably accurate data as a basis of performance design is important. Assuming heat load to be constant, the basic data, of which the wet bulb and wind velocity are the most critical and also the most difficult to predict, should be selected to provide adequate performance during that season of the year in which most adverse conditions prevail. Normally this is during the summer, but in the gas industry it is during the winter that performance is most vital.

A deck type tower should, if possible, be set so as to be broadside to the prevailing wind. Local Weather Bureau data or preferably data collected by another plant nearby the proposed site, with due regard for obstructions or conditions peculiar to the specific location, should enable one to select a reasonably accurate design wind velocity.

A fact, that is sometimes overlooked, is that a tower designed on a low wet bulb temperature will perform more efficiently at a higher wet bulb temperature, and vice versa. For instance, a tower designed to cool water to a final temperature of 65° F. with a 60° F. wet bulb temperature under a specific set of conditions will, with a 70° F. wet bulb, other conditions being the same, cool to a final temperature of less than 75° F. Conversely with a wet bulb of 50° F. the final water temperature will exceed 55° F.

For summer conditions it would rarely be desirable to select the maximum wet bulb temperature recorded in the district, as such maximums occur infrequently and then for only short periods of time. A wet bulb temperature can be selected that will not be exceeded for more than a given percentage of the time during the worst months. The percentage of time of course to be determined according to the performance limits within which a given plant can operate.

Structural Design Considerations: Aside from performance design, a tower should be selected for its structural stability, freedom from wind-blown spray loss, and long life with uniformly efficient performance.

Structural stability and long life are primarily determined by mechanical design and quality of materials used.

Spray loss or water carried out of the tower due to wind velocity can be costly from standpoint of cost of make-up water as well as from standpoint of corrosion and maintenance cost of nearby equipment. The elimination of excessive spray loss involves the basic mechanical design of the tower in the relative arrangement and type of distributing system, decks, and louvers. In most towers any attempt to eliminate spray loss by baffles or drift eliminators reflects itself in a loss of performance efficiency for a given size. The ability to minimize this loss must be designed into the tower before it is selected for performance.

Uniformly efficient performance with minimum of maintenance, assuming the tower to be structurally well designed for the service, is primarily a question of maintaining a uniform distribution of water from top to bottom of tower. The primary distribution system should be a pressure or semi-pressure system of pipe, preferably cast iron, with a minimum of low pressure, high capacity, large orifice nozzles or sprinklers. Flume and trough systems have been almost universally discarded due to high maintenance costs. The decks should be so constructed as to prevent warping or sagging, easily removable, and easily cleaned, and at the same time provide a maximum of surface to break up and film the falling water.

In towers designed to accommodate open type coil coolers in the base, the three most important features are:

1. Flexibility of the distributors over individual banks of coolers to provide for properly distributing varying quantities of water over the coil surface.

2. Proper ventilation, without spray loss, of the coil shed to provide a free circulation of air over the coil cooling surfaces.

3. Accessibility of coils for piping and maintenance.

Mechanical Draft Towers: Mechanical draft towers of both the forced draft and induced draft type have been, in recent years, and are now being applied to water cooling problems on an increasingly large scale.

The development of the modern propeller type, multiblade, variable blade pitch fan, which efficiently moves large volumes of air against the relatively low back pressures required in forced draft towers, has probably, more than any other one thing, brought this type of tower within the economic scope of general cooling problems. Air conditioning has here again contributed, through necessity, to the more efficient operation of this type of tower due to limited space generally available for such equipment in that type of work.

Such towers are generally of the spray filled or deck filled type. The spray filled type contains no fixed surface and water is distributed throughout the shell or cooling chamber by means of sprays operating at 5 to 10 lbs. per sq. in. pressure. This type tower has limited application due to its inability to meet the average problem of relatively close approach to the wet bulb temperature.

Deck filled or so called "wood filled" towers are fitted with closely spaced grids, usually triangular bars arranged in reversing inclined rows, to an effective depth of about 12 ft. Water is distributed over the deck surface with spray nozzles or flume type splash distributors, and air is forced or induced upwardly through the decks to secure a highly effective contact of air across the film surfaces.

The conventional mechanical draft tower consists of a frame sheathed with solid tongue and groove lumber to provide an airtight and watertight chamber. A second sheathing of either solid or ventilated type is generally placed outside the inner sheathing with an air space between. This outer sheathing is primarily for appearance and protection of the inner sheathing and in a well designed tower contributes nothing to the actual performance of the tower. Where the occasion demands, this outer shell can be made of fire proof material.

The fan is mounted vertically at one side at the bottom in the forced draft type and forces air through the tower whereas in the induced draft type the fan is mounted horizontally, on top of the tower, and pulls air through openings arranged around the bottom of the tower.

Drift eliminators are mounted above the distributing system to minimize spray carry over. This loss normally will amount to about 0.2 of 1% of the circulation but can be made less at the expense of additional fan horsepower.

Air velocity through a deck filled tower is approximately 300 ft. per minute through the open unfilled area.

Individual cell sizes are determined by the capacity of a single fan against the back pressures encountered, which range from 0.25 to 0.375 in. water column. Where multiple cells are used a partition wall is installed between cells so that one or more fans may be shut down without by-passing air from the active to the idle cells.

The fundamental advantages of mechanical draft towers are:

1. Compact—small space requirement.
2. Not dependent on natural air movement.
3. Low pumping head.
4. Low spray loss or carry over.

Mechanical draft towers may be loaded to water concentrations of 6 GPM per sq. ft. although the average problem seems to fall between 1.5 and 3.0 GPM per sq. ft.

Air circulation induced mechanically removes dependence on natural air movement for performance.

The overall height for the average tower is 28 ft. and pumping head will vary from 19 ft. to 24 ft. depending upon design.

With a definite positive air movement assumed, spray loss is a matter of design compromise with fan horsepower, and can be made consistently low disregarding outside wind velocity.

The disadvantages of mechanical draft towers are:

1. Horsepower consumption of fans.
2. Relatively high first costs.
3. Tendency to recycle saturated air leaving tower back through the fans or air inlet when outside air movement is low or zero. This creates an artificially high wet bulb temperature of the entering air and affects performance accordingly.

It is realized that specific problems might be cited to prove a case for either the atmospheric deck type or the mechacnical draft tower but each has its definite place. The problem is one of proper application.

Let us assume an average problem of cooling 2500 GPM circulating water from 95° F. to 75° F. with a 70° F. wet bulb temperature and show a comparative selection.

1. Mechanical Draft Tower, either Forced or Induced Draft.

Net inside dimensions, 39 ft. wide x 54 ft. long x 28 ft. high.
Overall outside dimensions, F.D., 36 ft. wide x 56 ft. long x 28 ft. high.
Overall outside dimensions, I.D., 32 ft. wide x 56 ft. long x 28 ft. high.
Number cells, 3.
Average pumping head, 20 ft.
Pumping horsepower (20 ft.), 18.0.
Fan horsepower (motor input), 80.0.
Total horsepower (motor input), 98.0.
Relative cost installed, 1000.

2. Atmospheric Deck Type Tower with Wind Velocity of 1.0 Mile Per Hr.

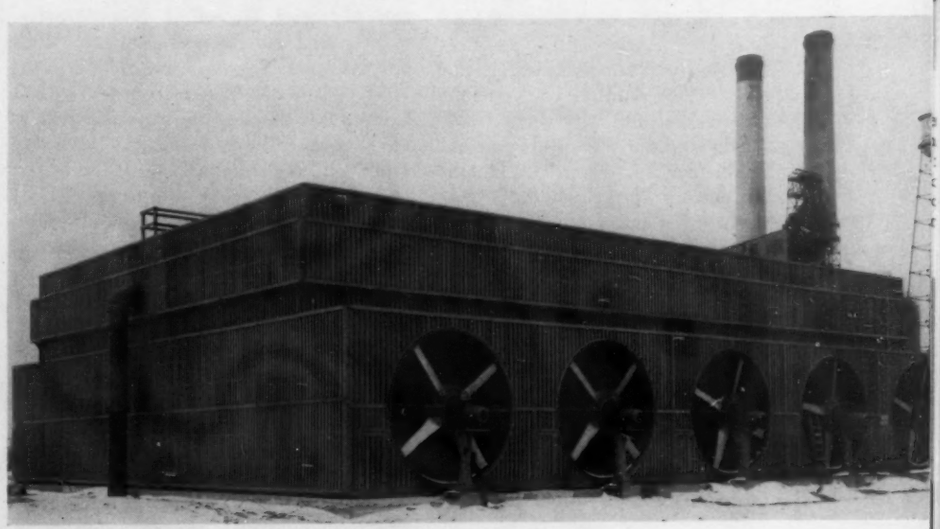
Net inside dimensions, 12 ft. wide x 204 ft. long x 44 ft. high.
Overall outside dimensions, 18 ft. wide x 210 ft. long x 44 ft. high.
Average pumping head, 45 ft.
Pumping horsepower (45 ft.), 41.0.
Total horsepower (motor input), 41.0.
Relative cost installed, 1000.

3. Atmospheric Deck Type Tower with Wind Velocity of 5.0 Miles Per Hr.

Net inside dimensions, 12 ft. wide x 132 ft. long x 44 ft. high.
Overall outside dimensions, 18 ft. wide x 138 ft. long x 44 ft. high.
Average pumping head, 45 ft.
Pumping horsepower (45 ft.), 41.0.
Total horsepower (motor input), 41.0.
Relative cost installed, 700.

Due to the great many variables involved, it is recommended, in any case, that careful consideration and proper weight be given to all of the factors affecting cooling tower design and performance to insure the most practical and most economical solution for the particular problem.

"Ten cell back to back" forced draft tower in Eastern refinery.



Look for yourself in this photograph. That is, if you were a delegate to the 35th Annual Con of that convention was the Hotel Del Coronado, Coronado Beach, Calif.; that L. M. Klauber o Gas Association, and that C. D. Weiss, of the San Diego Co., was general chairman of the c many gas men will return to the scene of the 1928 convention as delegates to P. C. G. A.'s

A Preview of Pacific Coast Ga

ONCE again the Pacific Coast Gas Association turns to San Diego and to the Hotel Del Coronado on Coronado Beach for its annual meeting. On September 18, P.C.G.A. President A. E. Holloway will call to order the first General Session, and P.C.G.A.'s 47th Annual Convention will be in full swing. To many of the delegates, the forthcoming meeting in San Diego will bring back fond memories, and a glance at the photograph at the top of this page will recall to them the September of 1928 when L. M. Klauber, general superintendent of the San Diego Consolidated Gas & Electric Co., conducted the affairs of the association, and reigned supreme over the Association's 35th Annual Convention.

The convention officially opens with General Sessions on Wednesday afternoon, September 18, when Mr. Holloway will deliver the President's Address. Featured speaker at this session will be Walter C. Beckjord, president, American Gas Association, who will discuss the development of the gas industry in the United States. The Women's Committee of the San Diego Consolidated Gas & Electric Co. will present a toast to San Diego. Election of officers will follow, and the meeting will close with "In Memoriam."

At the second General Session on Friday morning, September 20, Bernard T. Franck, vice president of the Milwaukee Gas Light Co., and chairman of A.G.A. Refrigeration Committee, will present a talk on gas refrigeration. Those who are interested in where the unemployment taxes go (and who isn't?) will hear a discussion on the subject by Robert A. Hornby, vice president, Pacific Lighting Corp., San Francisco, Calif. What the homemaker thinks — and says — will be revealed by R. S. Agee, sales promotion manager, Association of Gas Appliance and Equipment Manufacturers, and the home service department of the Southern Counties Gas Co., Los Angeles, Calif., will give a presentation "With Rhyme and Reason." Edgar N. Gott, vice president, Consolidated Aircraft Corp., will discuss the question that is in everyone's mind today, "Industry and National Defense."

No convention is complete without plenty of diversified entertainment. Motion picture fans will be shown a movie on Wednesday evening; dancing in the Circus Room will follow. Thursday's entertainment is topped by the Manufacturer's Hi-Jinks at the pool in the evening, followed by a cocktail party for both men and women. Dinner will then be served in separate rooms for men and women, with dancing again for the late stay-outers.

On Friday evening all delegates will gather for the annual banquet. Saturday's diversions will be the old favorite, golf, and the more recent hard-on-the-shoulder game, skeet shooting. The golf tournament at the Coronado Country Club will consist of three flights of 18-hole Medal and Blind Bogey. Prizes will be provided for the winner of low net and second low net in each flight, to say nothing of prizes for all players irrespective of flight for the low net, low gross, second low gross blind bogey, and several novelty prizes. The trigger men will have a chance to burn powder Saturday morning in an at-

C. JOHNSTONE
Managing Director

HARRY J. SMITH
Technical Section

A. F. RICE
Sales and Advertising

RAY LOGUE
Manufacturers' Section

nual Convention of the Pacific Coast Gas Association in 1928. You will remember that the scene Klauber of the San Diego Consolidated Gas and Electric Co. was president of the Pacific Coast n of the convention; that 401 delegates registered for that meeting. Now we are wondering how . G. A.'s 47th Annual Convention which convenes once again in San Diego on September 18.

Gas Association's 47th Convention

tempt to win one of the prizes for the best two-man team.

The Manufacturers Section takes the limelight on Thursday noon with R. G. Logue, Ward Heater Co., Ltd., as chairman. J. J. Delaney, Reliance Regulator Co., will give the report of the nominating committee.

At 2 P. M. the Manufacturers Section will be greeted by President Holloway, and manufacturers will review the four big jobs: Cooking, house heating, refrigeration, and water heating. Frank H. Adams, president, A.G.A.E.M., will discuss "Our Mutual Problems," and F. M. Banks, Southern California Gas Co., has chosen the topic "A Utility Looks at the Appliance Manufacturers." Other interesting presentations will be "Prevention and Cure of Service Troubles," by F. U. Naylor, Pacific Gas & Electric Co., and "Recent Activities in A.G.A. Testing Laboratories," by W. H. Vogan, supervisor, Los Angeles A.G.A. laboratory.

Thursday morning the Technical Section will meet with Grove Lawrence, Southern California Gas Co., chairman of the Transmission Committee, presiding. N. K. Senatoroff, Southern Counties Gas Co., chairman of Pipe Protection, will call on David Hendrickson, East Bay Municipal Utility District, to speak on "Measurement of Electric Current on Pipe Lines Using a Magnetometer," and on H. J. Keeling, Southern Counties Gas Co., to discuss "Equipment and Methods for Cathodic Protection Surveys."

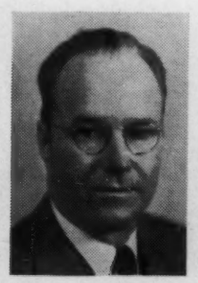
Various phases of pipe lines will be discussed as Chairman C. F. Briscoe, Southern California Gas Co., introduces M. L. Fort, Industrial Fuel Supply Co., who will speak on emergency equipment; R. W. Todd and A. B. Polley, Industrial Fuel Supply Co., "Construction of Submerged River Crossings"; and Harry J. Smith, Pacific Gas & Electric Co., "A Slide Rule for Computing Pipe Line Flow."

The Committee on Compressor Plants, under the chairmanship of J. H. N. Ellis, Industrial Fuel Supply Co., will hear from Hugh R. Lamberth, Fluor Corp., Ltd., on "Some Practical Aspects of Water Cooling Tower Selection and Performance" (see Page 37), and from C. G. Cortelyou, T. J. V. How and F. H. Noltimier, General Petroleum Corp., on "Modernizing Our Older Gas Compressing Equipment."

Other papers will be presented by members of the Large Volume Measurement Committee, with G. H. Briggs, Pacific Gas & Electric Co., as chairman. M. J. Cereghino, Southern California Gas Co., will advise on the installation and operation of orifice meters for industrial customers; and B. G. Williams, Southern California Gas Co., will give a report on orifice meters.

The Technical Section's meeting on Thursday afternoon will be opened by the chairman of the Distribution Committee, C. P. de Jonge, San Diego Gas & Electric Co. C. W. Capwell, of San Diego, is chairman of the Special Problems Committee and will introduce the speakers, J. T. Rutherford, Standard Oil Co. of California, and Thomas P. Jenkins, Pacific Gas & Electric Co., who will speak respectively on "Calodorant Concentration in Odorized Natural Gas" and "Elimination of Exhaust Gases from Truck Bodies."

J. S. SPAULDING
Advertising Committee



CHARLES GRUNSKY
Accounting Section

H. MUSGRAVE
Educational Committee

PRUDENCE S. HURY
Women's Committee

R. A. HORNBY
Presidential
Nominee

W. G. VINCENT
Vice Presidential
Nominee

D. G. MARTIN
Association's
Treasurer

B. T. FRANCK
Convention
Speaker

Following a committee report on modern calorimetry, by Guy Corfield, Southern California Gas Co., the Measurement and Regulation Committee, with W. L. Kindred, Southern Counties Gas Co., as chairman, will present talks on "New Meter Equipment," "The Comparative Capacity Characteristics of Regulator and Meter Installations," and "The Effect of Pressure on Meter Proof." Unaccounted-for gas will be discussed by the committee chairman, E. R. Ames, Southern Counties Gas Co.; the vegetation method of locating gas leaks, by Milton W. Heath, Heath Tree Service Co.

S. A. Bradfield, Southern California Gas Co., and chairman of the Construction and Maintenance Committee, announces that the "Imperial Valley Earthquake," "Application of X-Ray to Pipe Lines," and "X-Ray Examination of Pipe Joint Welds" will be given consideration by Charles Grunsky, the Coast Counties Gas & Electric Co., R. Richardson, Osborn & Nelson Co., and W. M. Henderson, Southern California Gas Co.

The Technical Section meeting Friday afternoon, under the leadership of M. L. Fort, chairman of the Production Committee, will offer "The Supply of Natural Gas and Production in California," by R. M. Bauer, the Southern California Gas Co., and a discussion of recent trends in repressuring and storage.

The Utilization Committee meeting under John C. Mueller, Payne Furnace & Supply Co., chairman, will present two reports from the Appliance Installations Committee, H. W. Geyer, of Southern Counties Gas Co., chairman — "Flexible and Semi-rigid Appliance Connectors in Field Tests," by D. C. Ellswood, Southern Counties Gas Co., and "Floor Furnace Installation Requirements," by R. J. Phillips, San Diego Gas & Electric Co.

The report of the Air Conditioning Committee by Art Hess, chairman, will be supplemented by speeches on "Improvements in Warm Air Residential Heating," F. Walker, Hayes Furnace & Manufacturing Co., and "Use of the Volume Damper Control," by B. W. Farnes, Control Equipment Co. A report of the Appliance Testing Committee by C. A. Thorp, Southern California Gas Co., will follow.

On Thursday morning the Domestic Sales Committee will be favored by an address of the chairman, O. R. Doerr, Pacific Gas & Electric Co. A motion picture on gas cooking will be shown by J. S. Spaulding, Southern California Gas Co. A new sales training course will be outlined by Hughes M. Blowers, regional supervisor, distributive education, department of education, State of California. R. E. Honey, Southern Counties Gas Co., will speak on "Lost Battalion — The Forgotten Soldiers of the Industry." "Long Range Planning for Profitable Business Building" will be the subject of J. H. Gumz, Pacific Gas & Electric Co. E. J. Strickland, Southern California Gas Co., will ask "Are Campaigns Blitzkriegs or Do They Build Business?"

Thursday afternoon the Commercial and Industrial Sales Committee will meet under the leadership of Otto Ketelsen, Jr., San Diego Gas & Electric Co.

Chairman A. F. Rice, Occidental Stove Co., will gather together the Sales and Advertising Section on Friday afternoon. Following the chairman's address, various topics on home service will be discussed by Van Pender, Barker Brothers; Hubert Tappan, Tappan Stove Co.; W. H. Jacobs, the Southern California Gas Co.; Marguerite Fenner, Pacific Gas & Electric Co.; Jessie Ewing, Southern California Gas Co.; Winifred Davison, Coast Counties Gas & Electric Co.; Grace Myers, the Southern California Gas Co.; Mildred Kier, San Diego Consolidated Gas & Electric Co.; and I. C. McGee, Seattle Gas Co.

Luncheon and five-minute talks will highlight the meeting on Thursday noon of the Educational Committee. Harrison Musgrave, Southern California Gas Co., is chairman.

The Women's Committee will partake of breakfast at the Thursday morning meeting with Chairman Prudence S. Hury charting the course of a group of talks by various women who will compare different phases of the industry with an airplane flight.

The Executive Committee of the Accounting Section will have a luncheon on Thursday noon, followed by a meeting for everyone in the afternoon. Friday afternoon the last meeting will be held in the Gold Room.

All in all, according to P.C.G.A.'s Managing Director Clifford Johnstone, the 47th Annual Convention promises to offer a most interesting and well-rounded program. And it must be remembered that once beyond the convention halls the delegate can see the many points of interest which San Diego has to offer — the world's largest observatory, zoo, aircraft factory, and beautiful Balboa Park.

■ ■

A.G.A. Offers Camera Contest For Amateur Photographers

The American Gas Association offers a new and different challenge to amateur photographers through a nation-wide contest for the best photographs of up-to-date, attractive kitchens which show modern gas ranges.

The contest closes midnight, December 1, 1940, and prizes are as follows: First prize, $250.00; second prize, $100.00; third prize, $50.00; and 20 additional prizes of $5.00 each.

This contest offers an opportunity for the amateur to test his or her photographic skill, knowledge of composition and lighting effects, and the ability to take an indoor shot of a difficult subject — the kitchen.

Complete contest details may be obtained by sending a postcard request addressed to: The Kitchen Contest Editor, American Gas Association, 420 Lexington Avenue, New York, N. Y.

■ ■

New Houston Paper Mill Will Use Natural Gas

The Champion Paper and Fibre Co., Houston, Texas, announces the start of operations of its new $3,500,000 paper mill to make paper from southern pine. By locating the mill in Houston, it is near the raw materials and ample quantities of natural gas.

It is expected that 120 tons of paper a day will be made in this mill which will be used in magazines and papers for southern markets.

The completion of this new $3,500,000 paper mill will add another to the list of new industries brought to Texas to take advantage of the natural gas there as reported in G A S, August, 1940, page 66.

■ ■

Servel Holds Conference

George S. Jones, Jr., vice president and general sales manager of Servel Inc., Evansville, Ind., presided over the mid-summer conference of department heads and regional sales managers held at Hotel Roosevelt, New York, N. Y. Louis Ruthenburg, president, was the opening speaker.

GAS Camera

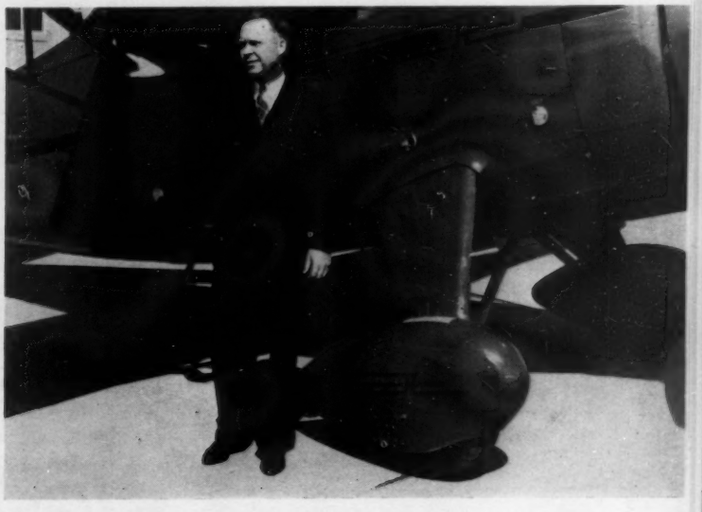
J. B. McNARY, manager and secretary, Canadian Meter Co., Hamilton, Ont., enjoying a joke while relaxing before taking up his new duties as president of the Canadian Gas Association. Mr. McNary is the first manufacturer to become the Association's president.

FROM SAN DIEGO came **A. E. Holloway** vice president n charge of sales for San Diego Consolidated Gas and Electric Co., and **Mrs. Holloway.** Mr. Holloway takes up the gavel this month as presiding official at Pacific Coast Gas Association's meeting in Coronado, Calif.

AMONG THE 176 delegates to the Canadian Gas Association's 33rd Annual Convention at Jasper Park Lodge, Alberta, Canada, in July (left to right): **T. P. Pinckard,** Hamilton; **H. R. Basford,** San Francisco; **A. H. Harris, Jr.,** Winnipeg; **Mrs. E. Rudd,** Aspinwall, Pa.; **C. E. Macdonald,** Toronto; **Mrs. H. R. Basford; Julian Garrett,** Edmonton; **Mrs. Julian Garrett; Mrs. T. G. Jeffrey,** Toronto; **N. S. Harris,** Toronto; **T. G. Jeffrey,** Toronto.

AT EARL CARROLL'S in Hollywood, Calif., **Mr. and Mrs. H. J. Smith,** and **Mr.** and **Mrs. C. K. Patton,** who last month visited Southern California on vacation. Mr. Smith is president of the Ward Heater Co., Los Angeles; Mr. Patton is new business manager of the Dallas Gas Co., Dallas, Texas.

R. L. BOWEN, president, Communit Public Service Co., Fort Worth, Texas, i shown in front of his new five-plac Howard Monoplane recently acquired fc use in making business trips to the com pany's properties. The new plane re places a Stinson which he has flown fc several years.



C. H. MANNEY, salesman, Fort Scott, Kan., (center, with his CP Range sales trophy) finds two admirers in **C. C. Young,** assistant new business manager, Gas Service Co., Kansas City, Mo., and **R. T. Bergh,** district manager, George D. Roper Corp., Rockford, Ill.

AT THE INVITATION of the Honolulu Gas Co., **Gladys Price,** Home Service Advisor of Southern California Gas Co., Los Angeles, in July made a 5000-mile tour to play a prominent part in the Hawaiian Islands 13th Annual Cooking School. Miss Price, fifth from left, was aided by **Valeria Coon,** at her right, and **Jeanette Moriyama** and **Joan Shimamura** at extreme left. Others are Japanese assistants. The four sessions of the school were attended by 5000 Japanese, Chinese, Hawaiians, and white people.

FRED ARMBRUSTER, supervisor of Ga Utilities, Middle West Service Co., Ch cago, Ill., and regional CP directo (right) and **Carl Sorby,** promotion directo of George D. Roper Corp., pose oblig ingly for the cameraman just before star ing on a CP promotional tour.

National Defense

Keynotes A. G. A. CONVENTION

THE vital importance of the gas industry in National Defense and its contribution to more pleasant living will be the dominant themes of the twenty-second national convention of the American Gas Association in Atlantic City starting the week of October 7.

Present national events which are shaping the course of the future will be dealt with in the general sessions by eight authoritative speakers whose appearance before the convention was arranged by George S. Hawley, chairman of the program committee.

Dr. Harold G. Moulton, president of the Brookings Institute, Washington, D. C., will open the series of addresses on the timely topic of "Industry in a Changing World." Dr. Moulton will drive home the pertinent lessons to be learned from today's happenings in the industrial world. Head of a national institution devoted to economic research and advanced training in public administration, Dr. Moulton is qualified to present his conclusion on the gas industry's problems.

Gas in Modern World

Walter C. Beckjord, president of the American Gas Association, and vice president and general manager of Columbia Gas and Electric Corp., will deliver the keynote address on "The Gas Business in the Modern World." President Beckjord will also preside throughout the general sessions.

Special attention will be devoted to national defense and the gas industry's opportunities in the rearmament program in an address by Franklin T. Rainey of Columbus, Ohio, chairman of the Association's Industrial Gas Section. This subject will be dealt with further in a symposium of industrial gas sales managers, and the technical phases of the national defense program will be probed at the Technical Section meetings.

The consumer movement has been receiving much attention, even in these war-conscious days. In recognition of this trend, John Benson, president of the American Association of Advertising Agencies, New York, will speak on "The Consumer Movement Is With Us —What About It?"

The parade of talent from outside the gas industry will continue on the general sessions' program with an address entitled "As Others See Us" by Elmo Roper of *Fortune* magazine. A noted market analyst who has done considerable work in the public utility and manufacturing field, Mr. Roper is probably best known publicly as the man who conducts the research work for the *Fortune* Magazine Public Opinion Surveys.

Frank H. Adams, president of the Association of Gas Appliance and Equipment Manufacturers, in an address on "A United Front" will further emphasize the Siamese-twin relationship of the appliance manufacturers and the gas distributing companies.

One of the recognized fathers of air conditioning, Dr. Willis H. Carrier, chairman of the board of Carrier Corp., Syracuse, will address the convention on this important topic. He is credited with research which led, in 1903, to development and installation in a Brooklyn lithographing plant of the first air-conditioning system.

Reverting to more prosaic problems, the gas industry will receive advice and information on financial subjects from Allan M. Pope, president, The First Boston Corp., and past president of the Investment Bankers Association. Under the title, "Financing Today and Tomorrow," he will review the methods of finance in the light of the present chaotic world conditions.

Although the pressing national questions considered in relation to the gas industry will make this convention the most significant in recent years, the incidental entertainment of the delegates has not been slighted in the convention program.

John St. John of Madison, Wis., chairman, has planned a surprise party with a large assortment of prizes at the Traymore Hotel, October 8, a dance in the ballroom of the Auditorium, October 9, and a ladies' card party and tea in the Ambassador Hotel, also October 9.

Informal pleasure is expected to be supplied by the standard attractions of the world famous Atlantic City without the necessity for formal arrangements. October 11, the day following the close of the convention, has been designated Gas Industry Day at the nearby New York World's Fair, with special exhibitions and affairs planned by the gas exhibitors. General admission tickets for the day will be furnished free to convention delegates by the Metropolitan New York companies.

The sectional meetings, which will be held throughout convention week, will specialize on various phases of the industry's operations and dissect the most pressing problems facing these branches of the gas business.

In accordance with previous custom, Monday, October 7, will be Natural Gas Day at the convention. The morning will be devoted to important natural gas technical and research committee meetings, while the formal program will be held in the afternoon. A novel luncheon meeting is being planned for the visitors.

Liquefaction Topic

Among the important papers to be presented on the Natural Gas Section program will be that on "Liquefaction, Storage and Regasification of Natural Gas for Peak Loads." Covering one of the most far-reaching developments of the year, this paper will present for the first time the engineering theory, construction methods and practical application of the plant now being built by The Gas Machinery Co. for The East Ohio Gas Co. in Cleveland. It will be presented jointly by Dr. R. W. Miller, research director, The Peoples Natural Gas Co. and Hope Natural Gas Co. of Pittsburgh, and J. A. Clark, chief engineer, Hope Natural Gas Co., Clarksburg, W. Va.

Another featured presentation on the natural gas program will be that by E. C. Connor, consulting engineer of Dallas, Texas, on "Methods of Valuation—Production System Property—for Rate-Making Purposes."

Tying up with the national defense theme, the Technical Section will offer many papers to the visiting engineers and chemists during Tuesday and Wednesday meetings. F. M. Goodwin of Boston is chairman of the section.

First approach to the new situation will be made by P. T. Dashiell of The

ROY ROGERS ★ COWBOY HATS AND BANDANNAS ★ EXCITING GIVE-AWAYS ★ RADIO ANNOUNCEMENTS ★ FLASHY RODEO WINDOW DISPLAY ★ PENNANTS ★ BALLOONS ★ STREAMERS ★ BILLBOARDS ★ BROADSIDES ★ NEWSPAPER ADS ★ RADIO ANNOUNCEMENTS ★ NEW MAGIC FLAME SOUND-SLIDE FILM ★ THEATER TIE-IN ★ GIFT OFFERS OF ALUMINUM ★ CHINA ★ PYREX ★ AUTOGRAPHED PICTURES OF

33 SURE-FIRE ATTRACTIONS GIVE YOU MORE ROUND-UP BUSINESS THAN EVER!

This portfolio contains 33 sensational business-attracting ideas that will shoot your profits sky-high in 1940! Magic Chef's 3rd annual Old Range Round-up will be the most successful Round-up ever staged. Here's why:

Copr., 1940, American Stove Company

1. "ALL-AMERICAN" MAGIC CHEF . . . a brand new gas range that 615 cooking experts helped design. It has twelve important new features (plus all regular Magic Chef features) that every housewife's goin' to want!

2. ROY ROGERS . . . a real movie star and the ladies' current heart-throb . . . leads Magic Chef's Round-up Parade. He's a regular guy too, and he'll corral your stray prospects and lead 'em right into your showroom!

3. SHOWMANSHIP . . . Big, 22 page Round-up Portfolio gives 33 sure-fire suggestions to get customers into your store. Brand-new rodeo window and floor displays . . . "atmosphere" decorations . . . exciting give-aways. Many items free.

4. ADVERTISING . . . More than 37 million messages this Fall in American Home, Better Homes & Gardens, Good Housekeeping, Ladies' Home Journal, Woman's Home Companion and Saturday Evening Post!

5. CALENDAR AND NEWSPAPER AD SUPPLEMENT . . . Tells when national ads will appear so you can schedule your newspaper ads to take full advantage of the interest these hard-hittin' ads will arouse!

Rope in your share of this tremendous ROUND-UP business! If you haven't received your Magic Chef 3rd Annual Old Range Round-up Portfolio and mailed your order, see your Magic Chef representative today.

AMERICAN STOVE COMPANY

World's Largest Manufacturer of Gas Ranges

BOSTON . . . NEW YORK . . . ATLANTA . . . CLEVELAND
CHICAGO . . . ST. LOUIS . . . PHILADELPHIA . . . SEATTLE
SAN FRANCISCO . . . LOS ANGELES . . . PITTSBURGH
BALTIMORE . . . WASHINGTON

Magic Chef

"RED WHEEL" GAS RANGE WITH THE LIFETIME BURNER GUARANTEE

Philadelphia Gas Works Co. in a paper on "Technical Problems of the Gas Industry in Connection With National Defense."

The first session will also include a paper on "Residuum Petroleum Oils in the Manufacture of Coke Oven Gas" by C. J. Ramsburg and G. V. McGurl of the Koppers Co., Pittsburgh, and one on "Elimination of Noise in Atmospheric Gas Burner Application" by R. M. Conner, director of the A. G. A. Testing Laboratories.

A New Subject

A new subject on Wednesday's program and one expected to attract widespread attention is that on "Plastics and the Gas Industry" which will be presented on Wednesday by Reginald L. Wakeman of Mellon Institute of Industrial Research, Pittsburgh. Other papers to be presented at this session include: "Determination of Combustion Characteristics of Fuel Gases" by Louis Shnidman, Rocester Gas & Electric Corp., Rochester, N. Y., and "Studies in Microbiological Anaerobic Corrosion" by Raymond T. Hadley, Susquehanna Pipe Line Co., Philadelphia. S. J. Modzikowski, chairman of the Chemical Committee, will present his committee's report and the report of the Gas Conditioning Committee will be made by its chairman, L. J. Willien.

The Accounting Section will be addressed by speakers on such subjects as "Wages and Hours," "Insurance Coverage," "The National Debt and Defense Cost in Relation to Taxes," and "Original Costs on Property, Plant and Equipment," and the increasingly important topic of "Depreciation."

Headliners in the art of sales and sales technique, including many top-flight sales executives, will participate in the Commercial Section program. Among those who will address the meetings are: T. V. Houser, vice president, Sears-Roebuck, Chicago, on the subject of "Retail Merchandising"; B. L. Johnson, editor, *American Builder and Building Age*, on "What the American Public Wants in New Homes"; C. C. Young, Gas Service Co., Kansas City, on the Certified Performance Range Program; and B. T. Franck of Milwaukee, A. G. A. Refrigeration Committee chairman on Refrigeration.

Other speakers include George F. B. Owens, assistant vice president, The Brooklyn Union Gas Co., on "What Is Happening to the Domestic Load and What Are We Doing About It"; B. H. Wittman, The Peoples Gas Light & Coke Co., Chicago, on "The Certified Quality Program," and W. J. Schmidt, Long Island Lighting Co., on "Water Heating Promotion."

"Home Service in the American Way of Living" will be the theme of the program at the Home Service Breakfast to be held Wednesday morning at the Hotel Traymore. Mrs. Eliza M. Stephenson of the Jersey Central Power and Light Co., Asbury Park, N. J., will preside as chairman of the Home Service Committee.

The home service program is composed of a group of short talks by home service directors and will deal with the subjects of sales floor activities, maids' classes, school contacts, radio and advertising. Greetings from Association executives will be followed by a Cook Book Review during which authors of well known cook books will be introduced.

The Industrial Gas Section program includes several innovations. With Franklin T. Rainey, chairman of the section, presiding, the Wednesday meeting will concentrate on the use of gas in national defense. The feature of this session is the symposium of industrial gas sales managers on the subject, "Further Aspects of Gas in National Defense." Under the leadership of Henry Obermeyer of New York, the symposium will cover (1) Sales Opportunities, Policies and Financing; (2) Cooperating with Plant Production Men; (3) What of Equipment and Controls? (4) The User's Viewpoint.

CALENDAR

September

Empire State Gas and Electric Association — Annual Convention, Westchester Country Club, Rye, N. Y., September 26 and 27.

New England Gas Association, Accounting Section — September 26, Hotel Bond, Hartford, Conn.

Pacific Coast Gas Association — Annual Convention, Hotel del Coronado, Coronado, Calif., September 18-20.

Wisconsin Utilities Association, Accounting Section — Lawsonia Hotel, Green Lake, Wis., September 16-17.

October

American Gas Association — Annual Convention, Atlantic City, N. J., week of October 7.

Independent Petroleum Association of America — Dallas, Texas, October 16-18.

National Safety Congress and Exposition — Stevens Hotel, Chicago, Ill., October 7-11.

New England Gas Association, Operating Division — Hotel Bond, Hartford, Conn., October 23.

Public Utilities Association of West Virginia — Twenty-second Annual Meeting, The Greenbrier, White Sulphur Springs, October 4-5.

November

American Petroleum Institute — Twenty-first Annual Meeting, Stevens Hotel, Chicago, Ill., November 11-15.

Mid-West Gas School and Conference — Iowa State College, Ames, Iowa, November 11-13.

December

National Association of Railroad and Utility Commissioners — Miami, Fla., December 10-12.

National Industrial Council — Waldorf-Astoria Hotel, New York, N. Y., December 9-10.

R. W. Thomas Will Head New Synthetic Rubber Company

R. W. THOMAS, head of Phillips Petroleum Co.'s Philgas Department, was elected president of the Hydrocarbon Chemical & Rubber Co. at a board of directors meeting held in August. Other officers elected are: Waldo L. Semon, vice president and director of research; Hy Byrd, secretary; H. P. Gangwer, treasurer.

R. W. THOMAS

A. B. Cameron, formerly manager of Philgas retail operations, will assume active management of Philgas Division, headquarters in Detroit.

The newly-formed Hydrocarbon Chemical & Rubber Co. was organized by the Phillips Petroleum Co. and the B. F. Goodrich Co. to manufacture a new synthetic rubber. Rapid progress is claimed in the adaptation of the new product to many commercial needs and production is being increased substantially to place samples in the hands of industrial and military users. (*GAS*, August, 1940, page 28.)

In addition to his duties as president of the new company, Mr. Thomas retains responsibility for Philgas activities as part of the Special Products Department.

■ ■

Houston Natural Gas Corp. Has S.E.C. Revision Approval

The Securities Exchange Commission recently approved a proposal by the Houston Natural Gas Corp., Baltimore, Md., a registered holding company, for the dissolution of four subsidiaries, the Houston (Texas) Natural Gas Co., Texas Natural Gas Utilities, Houston, Gulf Cities Natural Gas Co., Goose Creek, Texas, and the Tex-Mex Natural Gas Co., Houston, and the eventual replacement of itself with a new corporation which would be exempt from the Public Utility Holding Act.

Upon completion, it will be a Texas corporation, operating public utility property wholly within the state of Texas. The Houston Natural Gas Corp. will no longer be a holding company and will be dissolved.

■ ■

Mississippi River Fuel Co. Renovates Compressor Plant

The Mississippi River Fuel Corp., St. Louis, Mo., has ordered scale removal operations at its compressor station at Biggers, Ark.

Scale has been removed from the water jackets of six 1000-hp. compressor units. The work was contracted by Dowell, Inc., which used two pump trucks and tanks in connection with the special chemical process employed.

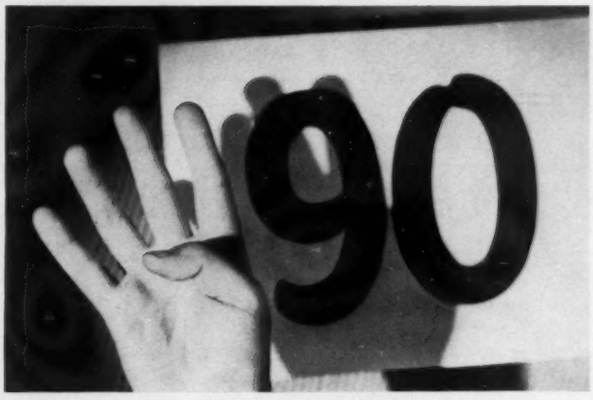
The company is planning on having changes made in its water treating methods at this station.

■ ■

Texas Public Service Co. Opens Building at Austin

President William Lawlor, Jr., presided at the recent opening of the new two-story Austin building of the Texas Public Service Co., Austin, Texas. The new building is equipped with Williams Aeromatic gas-operated air-conditioning equipment, heating in winter, refrigerating in summer, and ventilating between seasons.

Four Times WHAT makes *Ninety!*



Here's a problem in multiplication so simple and obvious it is surprising all gas utilities and their commercial managers aren't profiting from the answer:

Ten years ago, *four* floor furnaces were manufactured in this country. Lead in that quartet was WARD, who pioneered the floor furnace idea and built the first one 'way back in 1909.

This year, 1940, the A.G.A. Directory of Approved Appliances lists *ninety* different floor furnaces.

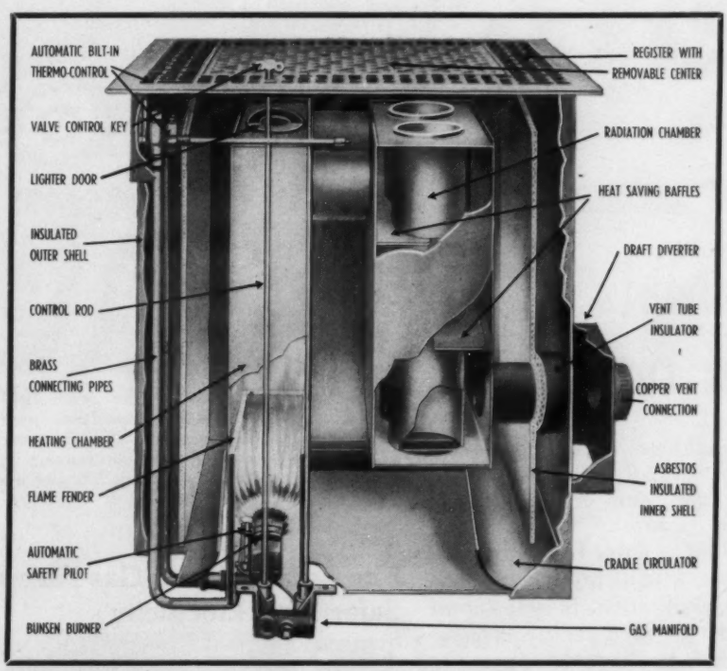
WHAT multiplied the *four* floor furnaces of a decade ago to the *ninety approved furnaces* (and some others) on the market today? There's just one answer . . . *demand!*

People want floor furnaces. They fill a definite need in the space heating business. Gas utilities that give them a major place in their merchandising programs are enjoying *profits* and *space heating load* that your company may be missing.

In many homes . . . where there are no basements, where first cost is important, or where certain installation difficulties exist . . . you can *get in on the ground floor* with a Ward Floor Furnace.

And this brings up another point: Although the number of brands of floor furnaces has *multiplied twenty times in ten years* . . . WARD is still at the top of the heap. This year, in spite of all the competition, we will sell more WARDS than in any of our previous thirty-one years of floor furnace building!

The reason for that might stand a little checking up on, too. Perhaps our latest catalog will furnish some interesting clues as to why you should *get in on the ground floor* . . . with WARDS!



FACTORY REPRESENTATIVES

A. S. KINCAID, *Southern Manager*, P.O. Box 5, Dallas, Texas . . . J. H. STUBBINS, 300 East 68th Terrace, Kansas City, Missouri . . . H. C. SANDERSON, 207 Fulton Building, Pittsburgh, Pennsylvania . . . L. E. KIRKPATRICK, 1700 15th Street, Denver, Colorado . . . LEON M. TAYLOR, 3200 Main Street, Dallas, Texas

ASK FOR OUR LATEST CATALOG

WARD HEATER COMPANY

LOS ANGELES

For 31 years WARD FLOOR FURNACES have grown in importance in the merchandising programs of many utilities. Today we make floor furnaces *exclusively* . . . 62 models adaptable to a wide variety of heating requirements. WARD FLOOR FURNACES are *ten-year-guaranteed* appliances with a proven record of service. They will please your customers . . . and profit your company.

Get in on the Ground Floor with

WARD

Floor Furnaces

YOUR LOAD IS AS GOOD AS THE APPLIANCE YOU SELL

SOUTHERN CALIFORNIA TELEPHONE COMPANY

(Attachment to letter of July 25, 1940, from the President to each employee of the company)

CITIZENSHIP INFORMATION

(To be filled out, detached and returned not later than August 10, 1940)

1. Name .....

2. Department ..... Occupation .....

Employment Location ..... Residence address .....

3. Place of birth ..... Date of birth .....
(City or Town, State, Country)

4. Are you a citizen of the U. S. by birth ..... By your naturalization .....

5. If citizen by naturalization give date granted ....., Certificate No. .....

Court of issuance ..... City and State .....

6. If you claim citizenship by naturalization of parent give date granted .....

Certificate No. ..... Court of issuance ..... City and State .....

7. If not a citizen, have you taken out first papers .....

Place and date of taking out first papers .....

8. Give following information as to relatives:

NAME	Country of birth	Is he (or she) U. S. Citizen by: Birth	Naturalization
Spouse			
Father			
Mother			
Brothers			
Sisters			

9. Are you affiliated with any military organization .....
(National Guard, Army Reserve, Naval Militia, Navy and Marine Corps Reserves, etc.)

10. If so, state name of organization and rank or rating held .....

11. Did you ever serve any foreign government in any capacity .....

Name of government ..... Type of service .....

12. Have you read and do you understand the attached "Notice Regarding Secrecy of Communication" .....

The foregoing is a true statement of the facts to the best of my knowledge and belief.

Signature .....

Date .....

(Use back of form for any additional information)

July 25, 1940.

Form used by Southern California Telephone Co. in citizenship survey.

National Defense Plan Prompts Utility To Survey Citizenship of Employes

IN ITS dual capacity as trustee of one unit in the most widely used method of public communication, and as employer of a large number of variously situated workers, the Southern California Telephone Co., Los Angeles, has recently instituted an organization-wide citizenship survey as an added assurance against service interruptions under any conditions.

In announcing the program and asking for employe cooperation, President N. R. Powley made several statements that are equally applicable to other public service organizations such as the gas utility companies.

"It is traditional, in our business," he said, speaking of telephone communication, "that our organization is known for its loyalty, efficiency and high devotion to duty. The tragic conflict overseas, with its profound significance and implication, is well known to all of us. We need neither exaggerate nor minimize its serious portent; we must, however, recognize that it is our full duty—in fact, our highest duty—to support devotedly and effectively our government of the United States in its far-reaching plans for the defense of this Nation."

To implement this support, he explained that steps had already been taken to guard the more vital parts of the telephone plant and to restrict admission to certain buildings. Of the employes' part in these defense measures he explained further:

"In order that our company may know the citizenship of its personnel, each employe is being required to furnish certain information covering his or her citizenship and that of his or her immediate family. Will you kindly answer all the questions on the attached form and return it, through company mail, not later than August 10, 1940?"

Along this same line a recent notice in the B. C. (British Columbia) Electric Employees Magazine states:

"To assist the government, and as a convenience to its employes, the company has undertaken the registration of its employes. This work was started at the beginning of the week and is still in progress and must be completed by August 21, the official date of closing registration.

"The registration is a personal duty of the employe, and, as after August 21, 1940, the National Registration Act permits the company to employ only those who have registered, it is very important that every employe sees to it that he is registered by then . . ."

■ ■

Standards Association Accepts Requirement Sets

Three sets of requirements sponsored by the American Gas Association were accepted on July 15 as American Standard by the American Standards Association. These include recommended revisions to the current American Standard Approval Requirements for Hotel and Restaurant Ranges, Z21.3-1938; recommended revisions to American Standard Approval Requirements for Central Heating Gas Appliances, Z21.13—1940, which become effective on January 1, 1941; and a new set of requirements for deep fat fryers, entitled American Standard Approval Requirements for Hotel and Restaurant Deep Fat Fryers, Z21.27—1940.

This action supplements the prior 1940 record in which 10 sets of standards were adopted as American Standard on February 23, 1940, to become effective on January 1, 1941. These additional standards likewise become effective at that date.

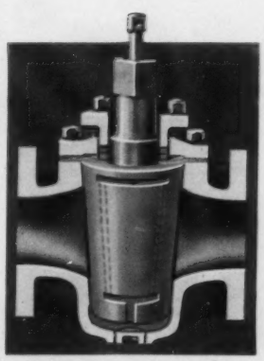
■ ■

Fire Reports Show Gas Far Safer Than Electricity

THE latest statistics compiled by the National Fire Protection Association, Boston, Mass., reveal that electrical fire losses during the last annual period totaled $25,200,000 and those from gas but $800,000; 70,500 fires were caused by electricity and electrical appliances and motors, and only 4000 by gas and gas appliances.

The United States will observe Fire Prevention Week this year October 6-12.

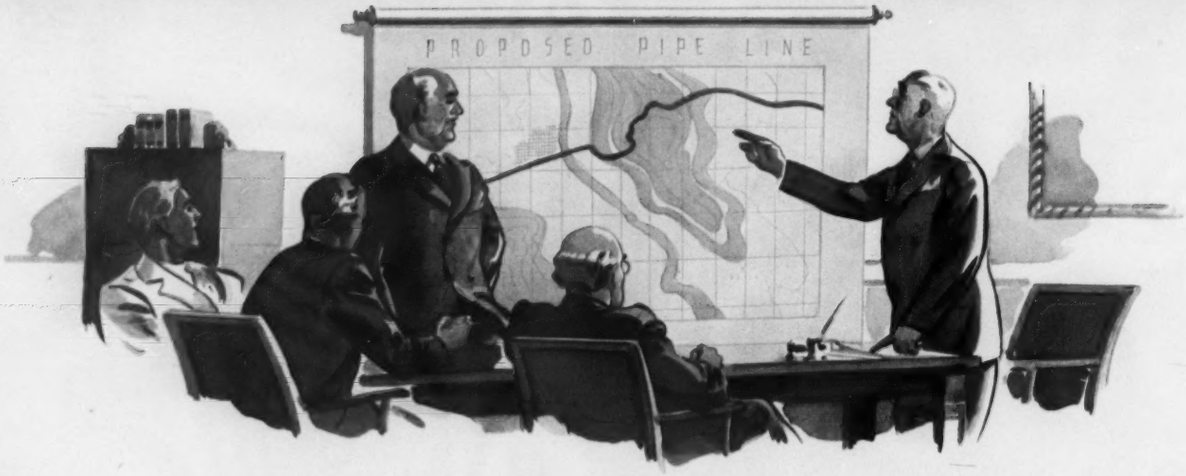
. . . There Stands a Gate with 7 Locks



At the south entrance of the great King Ranch in Texas there stands a gate. It is fastened by lengths of chain, joined by seven padlocks. For each lock there is a key; for each key an employee. So, if a lock is left unfastened, someone has explaining to do. How *simple!* How *effective!* ¶ Like an unlocked gate, a *valve* failure may cause tens of thousands of dollars in loss.

There are 7 principal valve responsibilities completely mastered by Nordstrom Lubricated Valves, namely: 1. Always easy to turn. 2. Fully leak-resistant. 3. Free from clogging. 4. Withstand highest pressures. 5. Operate at highest and lowest temperatures. 6. Resist corrosion and erosion. 7. Attain longest life. *Install Nordstroms. The saving is evident at every turn!*

NORDSTROM VALVES *give 7-way protection*



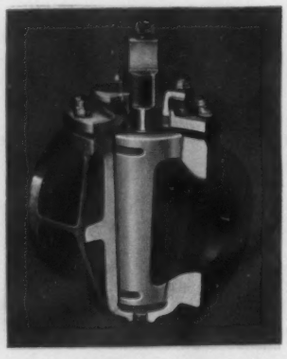
...So they invested $40,000 more and gained a valve bargain

A costly pipe line was recently installed involving the purchase of valves running into six figures. Valve bids were called. The Nordstrom Valve bid was approximately $40,000 more than for ordinary valves. The purchasing board favored the lower quotations.

"I'd like to see us choose Nordstroms, but $40,000 is a lot of money. Maybe we had better save it and take a chance," declared one of the officials.

"H'm, there must be a good reason why Nordstroms are so extensively adopted for pipe lines," commented a director of the company. "But," he continued, "I think we can use the cheaper valves. They won't be operated more than once or twice a year, maybe not that often."

Finally the Line Superintendent was invited to present his recommendations.



It isn't the price of a valve that counts; it's the service it renders. Choose Nordstroms. They keep up-keep down.

"A single valve failure could cost us more than $40,000," he commented. "Personal injuries as well as material losses can occur. Who will take the responsibility? Some of these valves won't be closed once in five years; then, no doubt, only for an emergency. A valve with exposed seats might corrode. Stuff can settle in the recesses, so it can't close tightly. From my observation Nordstrom Valves will always open or close, no matter for how many years they are untouched," he declared.

This set the officials to thinking. They investigated.

The result? Nordstrom won the order. Yet, even though the valves cost $40,000 more, the savings in upkeep and the safety insurance for decades to come will *far offset* this extra initial investment.

Nordstrom

LUBRICATED VALVES

Sealdport Lubrication

MERCO NORDSTROM VALVE COMPANY—*a Subsidiary of* Pittsburgh Equitable Meter Company

WORLD'S LARGEST MANUFACTURERS OF LUBRICATED PLUG VALVES; GASOLINE, OIL & GREASE METERS

Main Offices: 400 Lexington Ave., Pittsburgh, Penna.

BRANCHES: New York City, Buffalo, Philadelphia, Columbia, Memphis, Chicago, Kansas City, Des Moines, Tulsa, Houston, Los Angeles, Oakland.

CANADIAN Licensees: Peacock Bros., Ltd., Montreal. • *EUROPEAN Licensees:* Audley Engineering Co., Ltd., Newport, Shropshire, England

PRODUCTS: Nordstrom Lubricated Valves; Air, Curb and Meter Cocks • Nordstrom Valve Lubricants • EMCO Gas Meters • EMCO-McGaughy Integrators EMCO Regulators • Pittsburgh Meters for Gasoline, Grease, Oil, Water and other Liquids • Raybould Couplings • Stupakoff Bottom Hole Gauges

Coney Island in 1905, portrayed at Billy Rose's Acquacade, Treasure Island, Golden Gate International Exposition.

What the AQUASTAT Means to the AQUABELLE at San Francisco's AQUACADE

ALTHOUGH there is nothing unusual about heating water with gas, there is something outstanding about the stellar role that gas water heating is playing in one of the most successful large scale ventures in theatrical history. By this time, there may be a few people who have not heard of Billy Rose's Aquacade. There are possibly a few more who do not realize the relation between the aquastat on the boiler and the aquabelles in the pool, for dependable gas heating helps to maintain an even standard of pulchritude at San Francisco's 1940 Golden Gate International Exposition.

Here indeed the modern fuel finds itself in spectacular company, and discharges its function in a masterful manner. For the Aquacade, there was constructed the biggest wooden swimming tank in the world, heated by the biggest Scotch Marine boiler west of Chicago. Finally, the show has actually been drawing 40% of the Exposition's front gate which, according to the management, rates it as the most successful "inside" show on record. It is a story not only of good showmanship, but good engineering as well.

Building the Aquacade theater, which incidentally occupies the site of the Pacific Coast Gas Association's 1939 exhibit, presented many new problems; not, however, as to water heating, for gas already served efficiently practically all fuel requirements on Treasure Island. The theater seats 7000 within the shell of a 190 ft. by 650 ft. structure. The tank is 181 ft. by 45 ft., 12 ft. deep at the diving ends and 5 ft. in the middle. It holds nearly half a million gals. of fresh water, supplied from the Exposition reservoir on Yerba Buena Island at about 58° F. The water is in constant circulation through a pumping system which supplies 450 gals. per minute. It flows by gravity from the tank into two huge filters under the stage, is treated with chlorine and ammonia, then returns to the tank. During 12 hours every drop of water is filtered and treated.

From the filter, the water passes through the boiler on its way back to the tank. Aquastat control of the gas burners provides an unvarying water temperature of 74° F. The efficiency of the installation is well illustrated by the fact that, in the circulation of this tremendous volume of water, only 2° is lost in transit. Operating 12 hours daily, the boiler consumes 16,800 cu. ft. of natural gas.

Featured in the Aquacade are intricate ensemble swimming formations, performed to waltz-time from a diving start, and executed with smooth flowing rhythm. Thus, anyone who has ever jumped into a pool of cold water will recognize instantly the advantages of evenly maintained temperature. Water too cold might well shatter the composure of sensitive aquabelles; water too warm might make them listless. We may assume that the unfailing lure with which this spectacle draws increasing throngs, attests the perfection of gas conditioning.

Gas industry publications last year described minutely the many uses of gas on Treasure Island, ranging from the usual through the unusual to the unique. To avoid repetition, suffice it to say that in practically every instance of heating, water heating and cooking, modern gas equipment plays its part behind the scenes of the even more successful 1940 Exposition. Whether he is witnessing a peep show on the Gateway, eating a hot dog, or partaking of a meal in one of the Island's more sumptuous restaurants, the conscientious visiting gas man may be reasonably certain that he is patronizing home industry.

Acquabelles and their acquabeaux swimming in formation during one scene at Billy Rose's Acquacade, Treasure Island, Golden Gate International Exposition.

SALES Slants

• EXCERPTS FROM an interview with CLARENCE K. PATTON, new business manager, The Dallas Gas Co., Dallas, Texas.

It's Never Too Hot To Sell Gas Heating

IMAGINE walking up to a prospect with the thermometer reading 105° F., with your brow dripping with perspiration, and telling him a story about how to keep warm with gas, following up by asking him to buy a gas central heating plant.

Anyway, that's the way it's done by the sales organization of the Dallas Gas Co. In fact, during our warmest weather everyone in the company is out pounding the pavements telling the story of how better heating equipment brings better health and greater comfort during the winter season.

Texas winters have a peculiar way of delaying their appearance sometimes until after the first of January. Therefore, we must prepare early if we are to sell our consumers on the idea that there will be heating weather and that when it comes, their health and comfort can be properly protected only through the early installation of the best heating equipment available.

Preparations Start

On the first of July, we start preparation for this intensive heating campaign by conducting a heating school for salesmen. This school continues for two weeks, and is followed by still another school for heating dealers whose activities tie-in with our campaign.

The campaign begins in earnest about July 15, and you usually find one of the newspapers carrying a large advertisement advising the public to get ready now for a long cold winter. This is just the first gun in a generous barrage of newspaper advertising to support our campaign. And the newspaper campaign is just the beginning. Our sales activity is supported by a great mass of direct mail featuring our summer discounts and the "Buy now while it's hot" idea. On top of this, the company maintains a constant radio program which continually plugs our summer heating sales activity. Nothing is overlooked. It is our one big effort to sell better heating and greater comfort to the public of northern Texas, and you must remember that the Dallas Gas Co. is just a part of the Lone Star Gas System, and that this same program is functioning simultaneously in almost 300 Texas communities.

In addition to our advertising campaign, our sales story is strengthened by a special discount plan. From July 15 to August 15, a 15% discount is given on all heating equipment, and low unit down payments are extended on all equipment with the second payment to be made in October. Extended terms are also given during the campaign period. From August 15 to September 30, the discount is reduced to 10%. On September 30, the campaign ends and from that date on heating equipment is sold in routine fashion. After September 30, we enter into a water heating sales program, and during the months of November and December we concentrate on the sale of gas ranges and refrigerators. However, along with these additional sales activities, we give full effort to the carry-over of heating equipment sales.

The general territory salesman who handles ranges and water heaters also handle heating equipment sales. These men are all thoroughly trained in general engineering practices and proper heating methods. All of their work is subject to inspection and approval by qualified heating engineers.

As far as heating equipment is concerned, the company does not hesitate to tell its people that the best equipment is the central heating plant. Since the company does not actively merchandise central heating equipment and since this equipment is sold largely in new construction in metropolitan areas, the company maintains a department which spends much time and effort discussing this type of gas heating with dealers, prospective home owners, builders, architects, and others.

All Problems Considered

Close behind the central heating plant we promote the floor furnace, vented radiators, and vented circulators. The principal problem concerning the sale of this type of equipment is that of venting, but through careful planning and proper engineering we have solved this problem. In addition to all this, we promote an active and large scale program choosing the better type of unvented circulators and properly sized and properly applied fireplace heating equipment. In fact, every conceivable heating problem that can arise is given due consideration, and it is our purpose to render the public a complete heating service for their ultimate comfort and satisfaction.

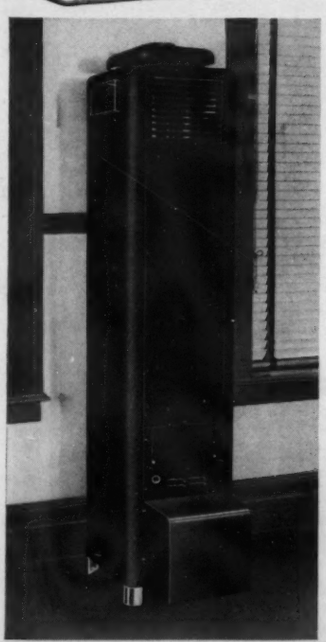
These are some of the Dallas Gas Company executives responsible for the company's sales future: Earl Brown, refrigeration sales; Jake Lynn, sales supervisor; C. K. Patton, new business manager; O. A. Kinzer, house heating engineer; and C. C. Young, assistant supervisor.

"BIG LOAD" MONTHS AHEAD

CASH IN WITH HUMPHREY SPACE HEATING EQUIPMENT

GAS UNIT HEATERS

Wherever new industrial buildings are being rushed to meet the production needs of the hour, wherever old buildings are being put into service again, wherever commercial buildings of all types need extra heat or new and better heating systems—those are the places to concentrate on Humphrey Gas Unit Heater sales during these next few weeks. Humphrey Gas Unit Heaters have all the features that make sales easier—modern design, attractive finishes, amazing compactness, efficient forced combustion burner, positive safety pilot control, and low operating costs.



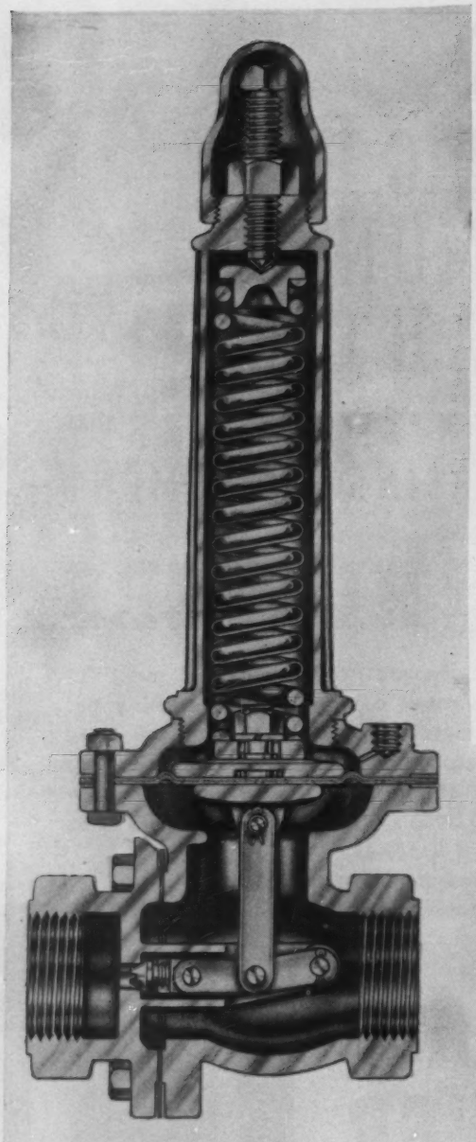
New Humphrey HEAT TOWER

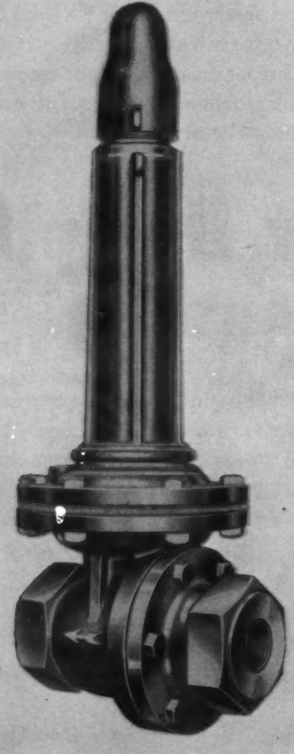
For office heating, for the complete heating of small homes, the new Humphrey Heat Tower brings you great new sales opportunities this Fall. It takes but 19" by 27" of floor space, has an input rating of 75,000 B.t.u. per hour.

Deflecting louvres, as shown at left, give three-way forced circulation for the heating of offices. Duct openings on all four sides are provided for home heating.

New sales literature gives you all the information you need to build effective sales presentations on Humphrey Gas Unit Heaters and the new Heat Tower—send for it today.

GENERAL GAS LIGHT COMPANY
KALAMAZOO, MICHIGAN
23 Warren St., NEW YORK CITY 2nd Unit Santa Fe Bldg., DALLAS 475 Eleventh St., SAN FRANCISCO





Above: Cross sectional view of the new Reynolds half-ton regulator shows the rugged construction of this unit. At the right is the outside view of same regulator showing the bronze inlet casting coupled to main casting.

REYNOLDS *for* HIGH PRESSURE CONTROL

● REYNOLDS HIGH PRESSURE REGULATORS have been tested for performance and safety factors for pressure from 2,000 pounds down to 300 pounds. In addition to regulators covering the high pressure field, REYNOLDS manufacture a complete line of regulators covering the entire range of pressures.

REYNOLDS ½ TON REGULATOR

● Designed with ample factors of safety, this Regulator will handle pressures up to 1,000 pounds reducing same to pounds.

The feature of this Regulator is the bronze casting on the inlet side, which insures that there is no high pressure or inlet gas against the cast iron body. The inlet connection complete with pipe connection and fixed fulcrum is a one-piece bronze casting. This arrangement eliminates outside connection, and the possibility of leaks where the toggle pin goes through. With the toggle a part of the bronze casting, pressure on the toggle will not push it away from the cast iron body to which it is bolted.

If you have a High Pressure Control Problem, let the Reynolds Engineers help you solve it.

● REYNOLDS PRODUCTS

High Pressure Service House Regulators: Straight Lever Type—Models 10-20 Series. Toggle Lever Type—Model 30 Series.

Low Pressure Service or Appliance Regulators.

District Station Regulators. Single or Double Valve. Auxiliary Bowl and Automatic Loading Device Optional.

High Pressure Line Regulators—Pilot Loaded—Pilot Controlled.

Toggle Type Regulators. Single Valve. Double Valve. Triple Outlet.

Seals: Dead Weight or Mercury.

Relief Valves: High or Low Pressure.

Back Pressure Valves. Automatic Quick-Closing Anti-Vacuum Valves.

Automatic Shut-Off Valves.

Lever Operated Valves.

Louver Operated Device.

Atmospheric Regulators.

Vacuum Regulators.

BRANCH OFFICES

423 Dwight Building
Kansas City, Missouri

2nd Unit
Santa Fe Building
Dallas, Texas

REPRESENTATIVES

Eastern Appliance Company
Boston, Massachusetts

Wm. A. Ehlers
No. 268 Park Street
Upper Montclair, N. J.

REYNOLDS GAS REGULATOR COMPANY

ANDERSON, INDIANA, U.S.A.

RECOGNIZED GAS CONTROL SINCE 1892

SALES CAMPAIGNS

Advertising With a Chuckle

Hardly anyone can stop a reader like a first-class cartoonist, and when we found out that the Ruud Manufacturing Co. of Pittsburgh, Pa., had adopted a cartoon idea for an advertising campaign, we immediately dispatched a letter to M. M. Scott of Ruud's Advertising Department. P. M. Green, also of Ruud's Advertising Department, sent us a few facts.

The company has prepared a booklet showing a complete series of Ruud and Monel cartoons as prepared for newspaper use. ("Yah sissy!" which you see here is by William Steig.) Six nationally-known cartoonists have contributed to this series which have

been running since March in five leading magazines. Among the old-timers cartoonists are Rube Goldberg, of Boob McNutt fame, Tony Sarg, *Saturday Evening Post* illustrator, and C. A. Voight, comic strip cartoonist. The newer crop of cartoonists includes George Price, who draws for *Collier's* and the *New Yorker*, William Steig and Barbara Shermund, well-known through *Esquire* and other magazines. A fall campaign of Ruud and Monel advertising using these and other various cartoon styles is now in preparation.

The Spring campaign which delivered more than 35,000,000 sales messages to able-to-buy-families marks the beginning of the third year of intensive national advertising on the Ruud's water heater. In 1938 the company put out 30,000,000 messages and in 1939, 52,000,000. The 1940 schedule, according to Mr. Green, will substantially top the two previous efforts.

The Kids Go to the Country

The Consolidated Edison Co. of New York can usually be counted upon to give us a lift when it comes to unusual sales promotion ideas. About a month ago we read a release on their "Triple-Hit" Automatic Refrigerator Campaign, which began on July 15. You've probably guessed it — it has to do with baseball.

In fact every time any player on the New York Giants, Yankees, or the Brooklyn Dodgers baseball teams makes a three-base hit, 10 under-privileged children (five boys and five girls) are sent to the country for a two-weeks' vacation. Consolidated Edison is sponsoring the campaign, and the vacation arrangements are made possible through the Children's Welfare Federation of New York, and a group of leading manufacturers and distributors of refrigerators, including Servel Electrolux.

This month we received another release from Consolidated Edison telling us that, up to July 4, the three New York teams had managed to bang out 30 three-base hits, and therefore, 300 children, who would otherwise spend a summer vacation on the city's sweltering sidewalks were packed off to the country for two weeks of joy and fun.

Thus far during the campaign there have been five days during which no triple hits were made. On July 28, five triples were registered, and 50 children went to camp all at one time. The Dodgers are leading with 15 triples, the Yankees are second with eight, while the Giants have registered seven.

The campaign closed August 31, and it was expected that at the present rate of progress enough triples would be hit to enable the refrigerator industry to give 700 children this vacation benefit.

We are beginning to blame Consolidated Edison for what's happened to Joe DiMaggio, feeling that Joe is pulling his punches and hitting three-baggers when he might be hitting home runs just so he can send 10 kids on a swell vacation.

Happy Babies

In reading the August issue of the *Servel Salesman* we came across the page "If You Should Ask Me!" conducted by Jane Tiffany Wagner, Servel's home economics director. From this we discovered that Servel has discovered "How to Keep a Baby Happy" and printed a booklet on the subject, which has been offered to gas company home service directors for quantity purchasing.

Of course the Servel Electrolux plays a major role in keeping babies happy, as Miss Wagner goes on to state: "A bewildered young mother, confronted with the multiple problems of sterilizing foods, water, bottles, and equipment, will be delighted to learn that a new Servel Electrolux allows her to make up all the day's needs in one operation. Here's where constant cold means most, for any mother appreciates the fact that old-fashioned hit-or-miss on-and-off refrigeration is not good enough for her baby!"

In this beleaguered world, it is our feeling that anyone beyond the age of 18 months has a decidedly limtied chance at happiness, and we are glad to note that Servel is pushing its happiness campaign where it will do the most good.

Vacations In Texas

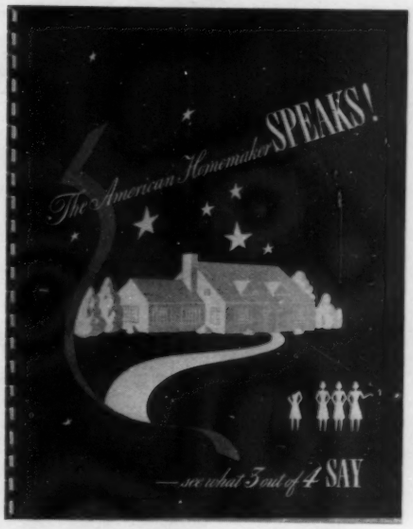
One of the many interesting house organs which reach our desk is the *Southern Union News*, published by the Southern Union System of Dallas. On page 24 of the July issue we read an article by Frank Carr on Southern Union's Fifth Annual Vacation Fund Campaign.

The campaign was decidedly a success. Scores of unsurpassed gas appliances were sold, thousands of customers made happy, and vacation checks totaling $2,675.52 were entered to the credit of 188 employes.

Incidentally, Southern Union has shown remarkable progress in gas appliance merchandising. Back in 1929 its total sales registered just a little over $10,000. In 1939 the figure zoomed to $426,314.70, and the 11-year record shows that Southern Union has sold appliances valued at a total of $2,298,951.48.

The CP Range This Fall

ANY day now gas company sales managers will be receiving a colorful campaign portfolio entitled "The American Homemaker Speaks" (see cut). This will mean that the Fall-Winter Sales Promotion Campaign in behalf of CP (Certified Performance) Gas Ranges projected throughout the United States and Canada by the American Gas Association and Association of Gas Appliance and Equipment Manufacturers is on in earnest. A revised edition of the booklet carrying the same theme, but meeting the needs of department stores, specialty shops, and other dealer outlets will be distributed the first of this month.



To give you an idea of what this portfolio will look like, we publish a photograph of its cover. The book is divided into three parts. The first section gives the viewpoint of the homemaker, and one does not have to guess twice that the majority of housewives want modern kitchens with up-to-the-minute gas ranges, as evidenced by recent market anlyses and statistical compilations. The second part, "The Gas Industry Speaks," gives case histories of successful CP promotions by leading gas companies in various parts of the United States, and the third — a most important division — outlines how gas companies can apply the facts and successful experiences described in the two previous sections to make the Fall-Winter Campaign the best yet.

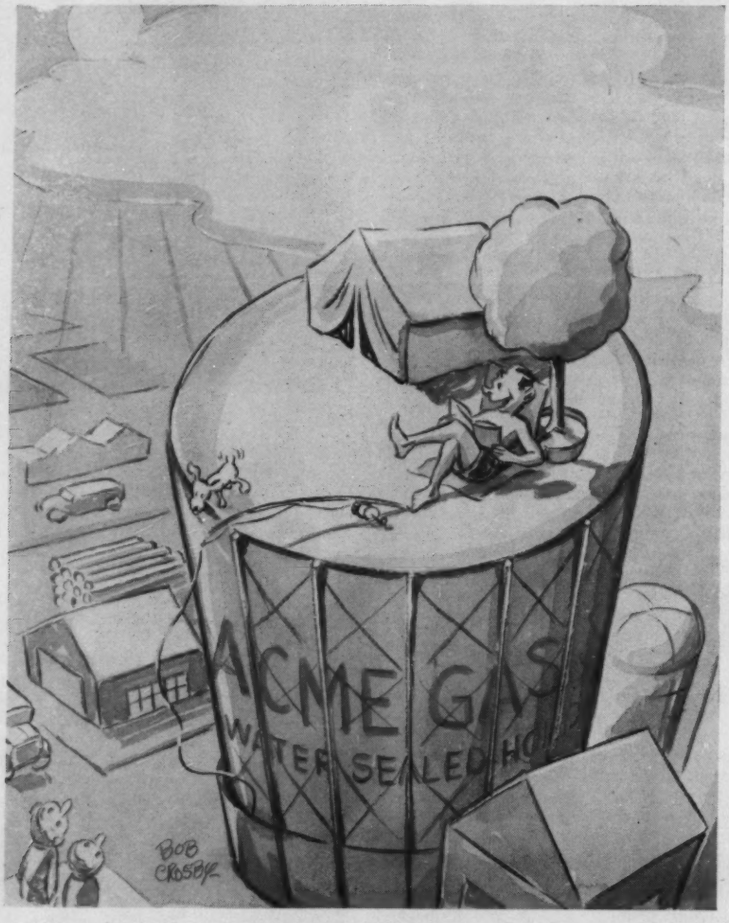
Same Subject — Continued

While we are still on the subject of the CP range, we had better make some comment on the promotional material the American Stove Co. sent us last month. From this we discovered that Roy Rogers, the cowboy star of Republic Pictures, is "Ridin' the Range" for Magic Chef's in their Third Annual Range Round-Up.

In essence, the booklet says that the American Stove Co. is standing behind local "round-ups" with a great fall national advertising campaign. Specifically, the campaign has three objectives: (1) to attract attention to gas range displays in retail outlets, (2) to stimulate interest in modern gas cookery and the CP range, and (3) to back up all local campaigns with a national rodeo that will produce results. Every page or so, we discovered a picture of a beautiful girl in a blue jacket deftly placing a businesslike rope around a range, which makes us think the American Stove Co. means business.

To supplement the sales portfolio which contains every promotional device known to the advertising mind, American Stove sent along also its national advertising calendar for the months of August, September, and October, which graphically points out on just which days, in what publications, American Stove advertising will appear. The company then urges that all local advertising efforts be built around these publication dates.

DOTTED LINE ROSCOE . . . . By Bob Crosby



"It's Dotted Line Roscoe — he's on vacation this month."

If You Can't Find A Sale—Make One

"I WILL find a way or make one," said Hannibal, great warrior of ancient Carthage.

To find a way or make one was no simple problem for Hannibal. His undertaking was gigantic. The two great Mediterranean powers of Carthage and Rome, one on the African shore, the other on the European shore, were ambitious to make the sea through which their merchantmen plied with cargo and commerce their own to the exclusion of others.

It was the avowed purpose of Hannibal to see that Carthage survived, that Rome was annihilated. In fact, he had sworn hatred to Romans as a child of nine.

On becoming the war lord of Carthage, he organized an expedition and led an invasion into Roman held Spain, and across the Alps into Italy — a feat duplicated only once since in all history.

Although Carthage was eventually destroyed by the Romans, it was not until after Hannibal's time. Under his willful direction and determined leadership, Carthage won the position of dominant power of the Mediterranean and to Hannibal went a place in history with the world's greatest tacticians.

It is the lot of most of us to follow, leading the life of ordinary folks, with but a small majority "finding a way or making one." The great mass of people are committed to the life of humble workers and only a comparatively few shall be leaders. And the extent of one's leadership, as in the case of Hannibal, is to be measured by the degree of the individual will to find a way or make one.

There are sales to be had — more than you are getting. And in proportion as you make these sales, you command the fate of a few . . . by your will you alter and influence their lives for the better.

You'll probably never be a power over such vast territory as Hannibal controlled and your fame may in no way approach his — but you may be equally as worthy in that you use the power within you to find a way or make one.

■ ■

The Mystery Chef Renews Gas Cooking Broadcasts

The Mystery Chef has returned to the "air" after an absence of a year and a half from the microphone with Tetley & Co., Inc. (Tetley Teas) as his sponsor. The current talks are similar to those that were broadcast for four years (1935 to 1938) in behalf of the gas utilities operating on the upper Atlantic seaboard and the Pacific coast. These companies, numbering more than 100, included all the principal gas utilities in the regions just named.

The present broadcasts are virtually a continuation of the talks which ended a year and a half ago which had as their theme the phrase "Be an Artist at the Gas Range," which is the title of a cook-book that was distributed by the sponsoring gas utilities. This same cook-book is now available to listeners at 25 cents, accompanied by a wrapper from a package of Tetley Tea, the product of the present sponsor.

■ ■

New "Air-Ceal" Home Uses Gas For Winter Heating

A new "Air-Ceal" home has recently been opened for public inspection on Jamaica avenue in Wellington Heights, Pittsburgh, Pa., which, it is claimed, needs cleaning just once in 10 years. This modern home is the result of 10 years' research by its designers, Rousseau Homes, Inc., who announce that Air-Ceal homes will cost less than 10% more than a home constructed by the usual method.

The house has an automatic air-conditioned gas heating unit which heats the home for $92 per year, a new type of construction which seals out dirt and dust, double-glazed windows with aluminum frames fitted and caulked to produce an air-tight seal, walls sheathed with moisture and airproof building paper, and all small openings sealed.

■ ■

Old Oil Burners Converted To Gas By San Diego Man

Harold Summey, foreman of the sheet metal shop at the gas meter shop, of the San Diego Consolidated Gas and Electric Co., San Diego, Calif., has recently developed three gas burners out of old oil burners. These burners have been sold and installed in bakeries which were formerly using oil for fuel.

The added revenue to the company for gas in these three bakeries will amount to about $430 per year. The customers are all pleased with their conversions to gas, and in all three instances are actually paying somewhat less for gas than they previously paid for oil.

NEW WEDGEWOOD *De Luxe Gas Ranges*

C. P. Model 7385—with waist-high Barbecue Broiler. Large 18" Oven

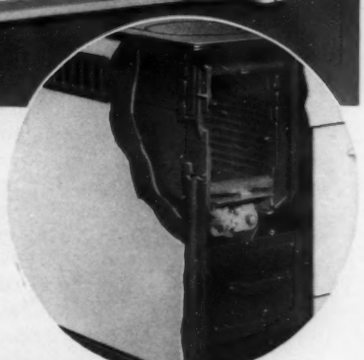
QUALITY *Plus* EFFICIENCY

These distinctly new De Luxe Wedgewood Ranges have large 18" oversize ovens, in addition to all of Wedgewood's outstanding cooking features.

Wedgewood Ranges Are Factory Built for All Types of Gas

CP MODEL 7122 BK—Compact De Luxe kitchen heater model. Cooks your food—heats your rooms—burns your trash.

Gas THE MODERN FUEL



WEDGEWOOD THE MODERN GAS RANGE

JAMES GRAHAM MANUFACTURING CO. • Los Angeles - San Francisco - Newark, Calif. — Portland, Oregon

Which refrigerator do people choose who've had
Experience?
"You never hear a thing . . ." said Bill Jones. "Just listen . . . silent, isn't it? And I can tell you, as one who's had experience, that's reason enough to buy an Electrolux. And no noise also means no wear, too!"
"Only a tiny gas flame . . ." Ted Walsh points out. "That's all it takes to do the work. Electrolux hasn't a single moving part in its freezing system. That's why you can depend on it to stay quiet, efficient and economical."
"My bills are lower . . ." said Mrs. Smith. "Food keeps much longer. And with no moving, wearing parts, Electrolux's operating cost will stay low always."
Easy to Buy
Easy to Own
New Low Prices (lowest in history). Liberal Trade-in Allowance—Low Down Payment—Long, Easy Terms.
Servel
ELECTROLUX
The Silent
GAS Refrigerator
NO MOVING PARTS TO WEAR
PERMANENT SILENCE
PERMANENTLY LOW OPERATING COST
LESS THAN 2c A DAY TO OPERATE
MORE YEARS OF CAREFREE SERVICE
SAVINGS THAT PAY FOR IT
5 YEAR PROTECTION PLAN
SAVES FOOD
SAVES FUEL
SAVES TIME
for good cooks who want
SURE RESULTS!
A MODERN GAS RANGE
Convenience, economy, freedom from worry about cooking results, and beauty of appearance that will give you a new pride in your kitchen—all these are yours with a modern gas range. See the new gas ranges, now, at your dealer's or your Gas Company. New low prices, liberal trade-in, long easy terms.
SIGNATURE
E-7529

Weakening Appliance Sales Resistance With an Advertising Barrage

By W. L. HUTCHESON

Merchandising Sales Manager, Manufacturers Light & Heat Company, Pittsburgh, Pennsylvania.

HE Manufacturers Light & Heat Co., Pittsburgh, Pa., in cooperation with seven other affiliated gas companies in Western Pennsylvania, Eastern Ohio, Northern West Virginia and Western Maryland, is sponsoring an extensive advertising campaign in 120 daily and weekly newspapers to stimulate sale of approved gas appliances.

The advantages of gas for water heating, cooking, refrigeration and house heating are the main points of the campaign. The chief emphasis is on the economy and superlative results obtained from approved gas appliances.

The advertising carries the specific suggestion to "See Your Dealer," thus permitting dealers to tie in their own brands with the general items advertised.

Electrolux gas refrigerators are given big space, with emphasis on dependability, low cost, permanent silence, and no moving parts. Gas furnaces, circulator heaters, and burners to convert present house heating systems to gas are featured according to the season.

The advertising is planned and prepared by Ketchum, MacLeod & Grove, Inc., Pittsburgh advertising agency, and is handled with the individual newspapers by district representatives of the various companies.

Eight gas companies, all part of the Columbia system, are participating in the campaign: Manufacturers Light & Heat Co., Manufacturers Gas Co., the Pennsylvania Fuel Supply Co., Natural Gas Co. of West Virginia, Cumberland & Allegheny Gas Co., Greensboro Gas Co., Fayette County Gas Co., and the Gettysburg Gas Corp., all of Pittsburgh, Pa.

The campaign began January 1 in 120 papers and will continue for the rest of the year.

The gas company officials state that there has been a pronounced increase in the sales of their appliances since the beginning of the 1940 campaign. It is reported that Electrolux sales in May were a good 8% above May, 1939, and that twice as many ranges have been sold in the first six months of 1940 as for the same period in 1939.

An intensive dealer campaign in the latter part of 1939 increased dealer sales of gas ranges in the greater Pittsburgh territory 74.3% over the same period in 1938.

The advertising serves to coordinate and supplement the dealer activities of the Gas Appliance and Promotion Division of Ketchum, MacLeod & Grove, Inc., created last year with the support of Manufacturers Light & Heat Co., the Peoples Natural Gas Co., and Equitable Gas Co., Pittsburgh, Pa.

This organization promotes the sale of quality gas appliances and the use of natural gas generally by providing sales assistance and advice, display material, dealer contests, and a monthly publication to all gas appliance and equipment dealers, equipment manufacturers and distributors operating in the greater Pittsburgh area — about 3000 in all.

The Gas Appliance Promotion Division is directed by Louis F. Demmler, under the general supervision of Emil Hofsoos, vice president of Ketchum, MacLeod & Grove, Inc. Edward T. Parrack edits *Gas Appliance Dealer*, the monthly publication.

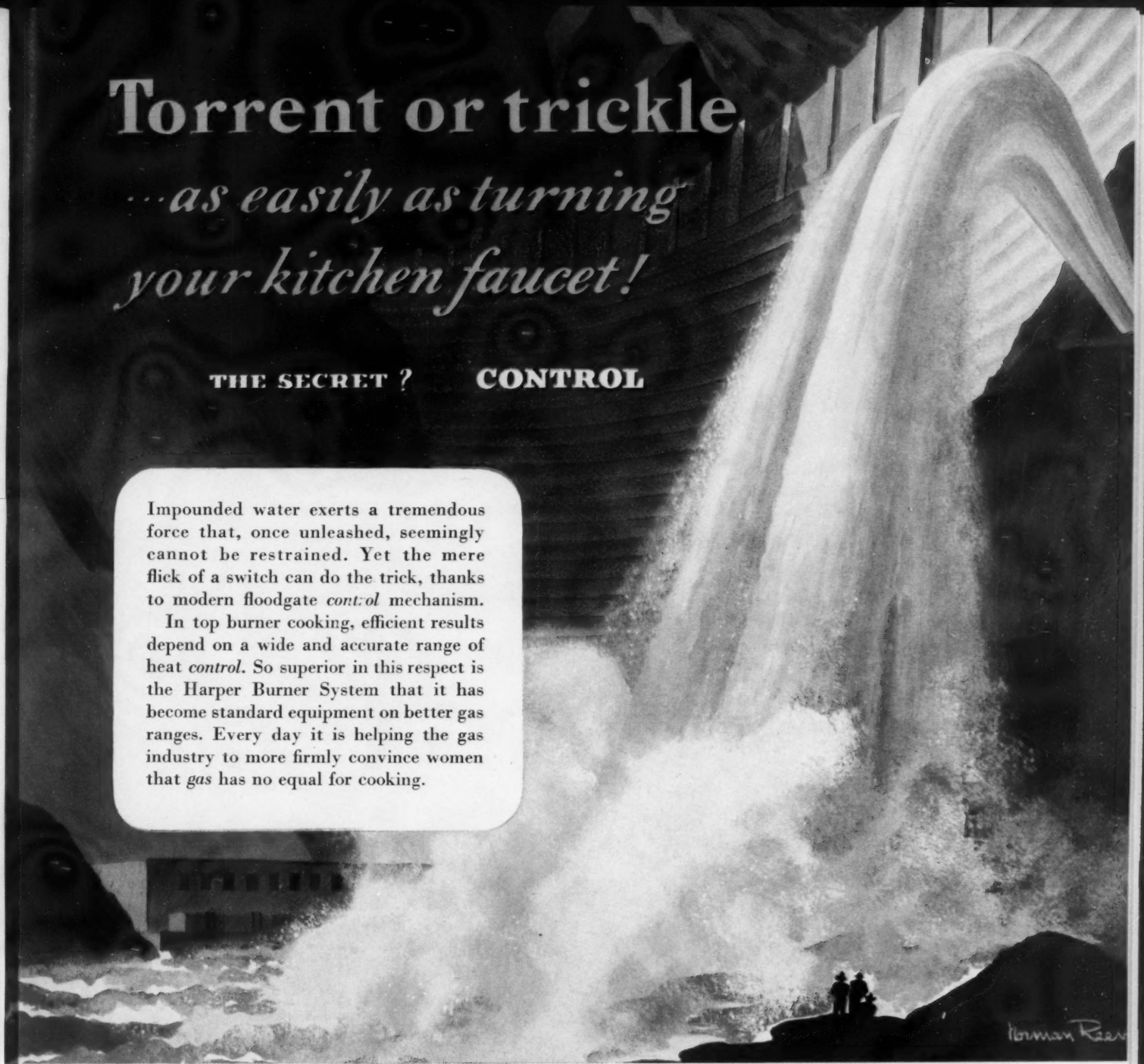
9 QUESTIONS
TO ASK YOURSELF WHEN YOU BUY
A REFRIGERATOR
Will it be permanently silent?
Will it give us longer service?
Will it save us money year after year?
Does it provide constant cold?
Will it keep us supplied with ice cubes?
Does it have every worthwhile convenience?
Are we assured of dependable service?
Will its low operating cost always be low?
Will it be a good long-time investment?
Easy to Buy
Easy to Own
Ask These Questions WHEN YOU BUY . . . and you'll find that only with Servel Electrolux, the gas refrigerator, is the answer YES to every one—
Because the ELECTROLUX:
Has no moving parts to wear
Is permanently silent
Has permanently low operating cost
Costs less than 2 cents a day to operate
Gives more years of carefree service
Pays for itself in savings
Has a 5 year Protection Plan
See The Attractive New 1940 ELECTROLUX—NOW . . . AT YOUR DEALER'S OR GAS COMPANY.
Servel
ELECTROLUX
The Silent
GAS Refrigerator

Pacific Gas & Electric Co.'s Radio Program Wins Award

On September 1 the "Evening Concert" radio program of Pacific Gas and Electric Co., San Francisco, Calif., over station KYA, rounded out its first year. It is broadcast from 8 to 10 every evening, offering both classical masterpieces and modern works. At a public gathering of public utility tycoons from all parts of the country, this radio program was awarded first prize as the best program sponsored by a public utility corporation.

Blooming Rose To Have Gas

The Indian Creek Gas Co., Peytona, W. Va., has received permission from the Public Utilities Association of West Virginia to furnish natural gas service in the vicinity of Blooming Rose, Boone County, W. Va. It is now serving Peytona and Brushton.


Torrent or trickle
...as easily as turning
your kitchen faucet!
THE SECRET ? CONTROL
Impounded water exerts a tremendous force that, once unleashed, seemingly cannot be restrained. Yet the mere flick of a switch can do the trick, thanks to modern floodgate *control* mechanism.
In top burner cooking, efficient results depend on a wide and accurate range of heat *control*. So superior in this respect is the Harper Burner System that it has become standard equipment on better gas ranges. Every day it is helping the gas industry to more firmly convince women that *gas* has no equal for cooking.
Norman Rockwell

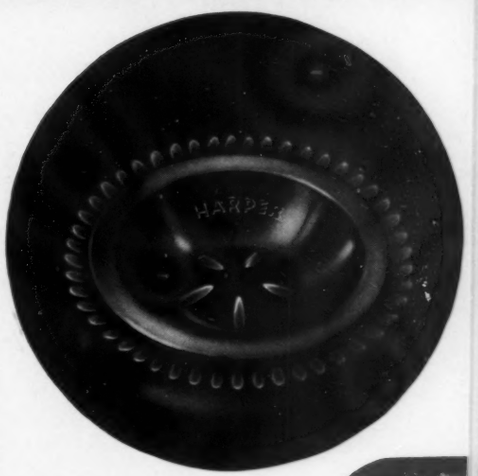
Copr. 1940, Harper-Wyman Co.

CONTROL *is the secret here, too*

● The Harper Burner System is a patented invention whereby each of the burners on the range is actually 2 burners in 1 . . . a burner within a burner . . . both operated and controlled by a single handle.

This arrangement affords a high-speed STARTING BURNER to *start* foods boiling and for fast frying . . . plus a small, central, economical COOKING BURNER for *maintaining* the cooking. The COOKING BURNER can be used entirely independently of the STARTING BURNER. No other top burner possesses this vital advantage — which insures easy, accurate control: just the right heat for every type of top burner cooking . . . every time.

HARPER-WYMAN COMPANY
8562 Vincennes Avenue, Chicago, Ill.



HARPER BURNER SYSTEM

HARPER BURNER SYSTEM

Demonstrates GAS at its best

SEE OTHER SIDE OF THIS PAGE

For boiling drinking water . . .

The HARPER BURNER SYSTEM

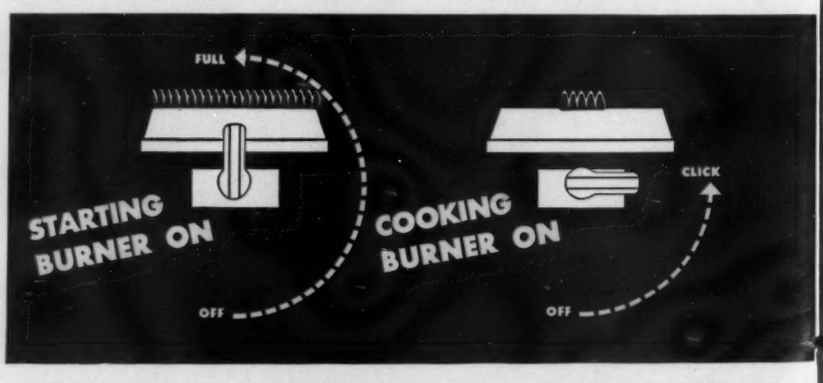
"does it better"

In many localities, there are times when it is desirable to sterilize drinking water. Boiling for thirty minutes assures complete safety—also causes certain impurities to settle to the bottom of the kettle. The water is more clear and pure. And here again is an example of why the Harper Burner System "can do it better".

The small, economical Harper COOKING BURNER provides sufficient heat to keep an eight-quart kettle boiling. More heat could not make the water any hotter, or hasten the sterilizing operation—it would only waste gas and evaporate the water from the vessel. More water is left when boiled the Harper way.

Just as in other cooking, the large flame of the Harper STARTING BURNER is used to bring the water quickly to the boiling point. Then the small COOKING BURNER is used to finish the job. Nothing complicated about it—just the simple turning of a handle.

The Harper Burner System provides a burner within a burner. The diagram below shows how the COOKING BURNER operates entirely independently of the STARTING BURNER. Yet both are controlled by the same handle.



We shall be glad to send you, without cost, two booklets that tell the complete Harper Burner System story . . . "Modern Methods of Top Burner Cooking" and "The Greatest Cooking Discovery in 40 Years". They should be valuable to anyone interested in the promotion of gas cooking and gas appliances. *Harper-Wyman Company, 8562 Vincennes Avenue, Chicago.*

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THER SIDE
F THIS
AGE

HARPER
BURNER SYSTEM

By DALE REMINGTON

Advertising Manager,
Wisconsin Public Service Corporation,
Green Bay, Wisconsin.

"OH MAE, WHAT'S WRONG WITH THE HOT WATER?"
They're changing "you can't get blood out of a turnip" to: "YOU CAN'T GET HOT WATER OUT OF A COLD TANK." But you can get a gas automatic water heater for nothing, or next to it, under the credit building 75% Discount Plan. Take your baths when you want to this year and forever after . . and let the gas heater that does it for you help pay for itself. ASK any Public Service, Salesman or Water Heater Dealer.
"NOTHING the 75% DISCOUNT PLAN AND A NEW WATER HEATER CAN'T CORRECT"
(have you seen the heaters with rustless Monel tanks?)
WISCONSIN Public Service CORPORATION
Get these Appliances NOW From Any Dealer and Earn a 75% Discount on Your Added GAS use for the Next 2 Years

A survey directed the trend of Wisconsin Public Service Corporation's gas water heating advertising.

What IS Hot Water's Most Important Use?

WHY do people use hot water? What are the appeals that will strike home to the greatest number? As advertisers and sales managers study selling helps in water heater promotions, they either answer these questions factually or emotionally. If the latter, then the campaign runs heavily to irate gentlemen (?) worrying their beards with the aid of cold water or distressed Miss Americas appalled at the very thought of either not being able to shampoo their titian locks without a long wait for the water to heat, or of being forced to do the job with cold water.

Health and Beauty are favorite appeal approaches for the makers of heaters. A thousand men and women attending two Home Shows, in Wisconsin Public Service Corp. cities some distance apart, were asked to rate — one, two, three, four, and five in the order of their choice *the most important* uses of hot water service in their homes. They were given 14 suggestions, chosen from the appeals used by heater advertisers and personal observation. The survey group was a cross-section of all wage levels and family sizes, each one having paid 10 cents to enter the home show.

The uses for hot water rated in importance as follows, the number of votes each use received being given:

Dish washing	913
Bathing	866
Family laundry	847
Meal making	593
Child cleanliness	490
Hand washing	430
Shaving	404
Special laundering	352
Housecleaning	321
Sick room	262
Floor cleaning	98
Shampooing	72
Beauty	32
Window cleaning	21

As a result of this study the Wisconsin Public Service sales and advertising promotions this year will run heavily to the primary uses of dish washing, bathing, family laundry, and the secondary appeals of meal making, child cleanliness and hand washing. Beauty, housecleaning and window polishing will see little ink.

In addition to this inquiry, 1175 people at these same shows were persuaded to tell us what they figured hot water service for a family of four people should cost for one month. Inferentially they were reporting as well what they were willing to pay for such service. The results were inconclusive for any one price bracket, did show an overwhelming expectancy for costs of less than $2 a month, proved that cost of operation was undoubtedly the greatest single selling need in the local picture. The accepted average for the two communities varied between $2 and $2.25 a month for all families. This table shows that few people paid or expected to pay as much as this.

$ .75 to $1.00	311
1.05 to 1.25	153
1.30 to 1.50	158
1.55 to 1.75	134
1.80 to 2.00	134
2.05 to 2.25	139
2.30 to 6.00	146
	1175

■ ■

The Southern Gas Company Will Serve Three Towns

The Southern Gas Co., Kilgore, Texas, has recently given service to Greggton, Texas, and expects to serve Longview and Kilgore in the near future. Gas is being piped through a 4-in. high-pressure line from the new well on the Rogers Lacy estate near Longview that has been gaged at 84,000,000 cu. ft. per day.

The company is managed by H. G. Chambers, who was formerly the superintendent of the Longview district of the United Gas Corp., Houston, Texas.

Carol Miller of Servel, Inc., (left) presents a Clipper Ship to Clyde H. Potter, sales manager of Southern Counties Gas Co., one of the two won by the company in the national American Gas Association refrigerator contest, while Norman R. McKee, vice president in charge of sales, and A. F. Bridge, vice president and general manager of the company, look on.

Victory Dinners Climax Refrigeration Drive for California Utilities

TWO utilities serving Southern California, the Southern California Gas Co., and the Southern Counties Gas Co., both of Los Angeles, Calif., held "Victory Dinners" recently at the Mayfair Hotel, Los Angeles, climaxing the local activities in the 1940 National A. G. A. refrigeration campaign.

First "Victory Dinner" was that held early in August by the sales organization of the Southern California Gas Co. F. S. Wade, president of the Southern California Gas Co., and the Southern Counties Gas Co., and F. M. Banks, vice president of the Southern California Gas Co., addressed the group, and C. A. Miller, regional sales manager of Servel Inc., presented W. M. Jacobs, general superintendent of sales, with a model Clipper Ship prize award. J. E. Kern, general supervisor of domestic sales, was toastmaster and was designated to represent the company on the clipper ship trip to Bermuda in the event the Southern California Gas Co. continues to lead all other utilities in Division 1 selling Electrolux refrigerators at retail.

Presentation of national cash prize awards and prize awards of the company's tie-in contest was made. The tie-in contest used an air travel theme. Interesting phases of the tie-in contest were: A "Squadron Race" for retail appliance salesmen; a "Stewardess Contest" for appliance counselors; a "Navigators' Skill Test" for Electrolux dealer field representatives; and an "Altitude Handicap" for salesmen selling refrigerators at wholesale. A "Ground Crew Consolation Hop" was given for all contestants winning less than $25.

On August 19 the Southern Counties Gas Co. held its "Victory Dinner." F. S. Wade and A. F. Bridge, vice president and general manager, N. R. McKee, vice president in charge of sales, gave talks. Mr. Miller presented two model Clipper ship awards to Mr. McKee and Clyde H. Potter, sales manager, who was also toastmaster. William Reynolds, advertising manager, and Arthur L. Spring, Southern California manager; Jesse Powers, sales representative, all of Servel Inc., were also at the speakers' table.

Cash awards amounting to $105 were presented by Mr. Potter to E. F. Chamberlain, Floyd S. Parmenter and James A. Merigold, Southern Counties Gas Co., sales representatives, for outstanding sales efforts. In addition, Floyd S. Parmenter, H. W. Swanson, Ray C. Houck, and James A. Merigold received July "New Horizon" contest checks, bringing the total to $715 that has been given to 21 Southern Counties Gas Co. salesmen.

Running concurrently with the national "Pioneers of Progress" campaign, the company has been conducting a contest among its eight district commercial agents, and the prizes will be a free trip to the A. G. A. convention at Atlantic City.

As a further stimulus, two Servel dealer contests have been conducted throughout the territory served by the utility. One is closed, and 18 dealers were awarded tours to Alaska or Mexico City, Yellowstone, Grand Canyon, San Francisco, etc. During July and August the remaining dealers were pitted against each other in a consolation contest.

B. T. Franck, chairman of the A.G.A. Refrigeration committee, sent a telegram to the meeting and announced that the Southern Counties Gas Co., as of July 31 still leads Division 1 in two classifications. The greatest percentage of increase over last year's sales and greatest sales per 10,000 meters.

■ ■

Donald Duck's New Home Is Equipped With Gas

GAS takes its place in the production of animated cartoons as the fuel used in the new Walt Disney studio recently completed in Burbank, Calif. It is used in production principally for heating, water heating, drying and humidification.

The main boiler plant consists of two 190-hp. water-tube boilers, fired by automatic burner equipment. Nine low-pressure, 20-hp. section boilers, located at remote points throughout the plant, are used for utility water heating and in the air-conditioning system.

Through a meter set, gas is carried through 4-in. and 3-in. yard lines at 10 lbs. pressure to the various buildings, where it is subregulated to deliver to the various pieces of equipment the pressure best suited for each requirement.

Gas is also used in the studio's restaurant and coffee shop, located on the premises.

■ ■

Dallas Drug Store Installs Gas Air-Conditioning Plant

The first gas-engine-operated air-conditioning plant to be installed in a Texas drug store was placed recently in Skillern's newest drug store in Dallas, according to a report published in Lone Star Gas Co.'s *Blue Blaze News*.

The plant is automatically operated and is so designed that the first floor can be conducted independently of the basement unit, thus allowing the basement system to be turned off during the evening when the cafeteria is closed.

The 40-ton refrigeration plant consists of one 25-ton and one 15-ton machine and the gas engines, all housed in a 16 by 8 ft. room.

The heating system for the new store has gas-fired Carrier duct heaters and use the same duct system now being used for cool air comfort. An air exhaust system will also be installed.

■ ■

Ohio Fuel Gas Officials Hold Two-Day Meeting

Over 100 district managers of the Ohio Fuel Gas Co., Columbus, Ohio, were guests of The Tappan Stove Co. recently at a two-day meeting held at the Westbrook Country Club, Mansfield, Ohio. Nation-wide advertising, research, promotion and a year-round effort as well as shop talk and a preview of the 1941 plans were on the program. Alan Tappan, vice president of The Tappan Stove Co., gave an address.

■ ■

Hollis Office Moved

The Community Natural Gas Co., Dallas, Texas, has announced that its offices at Hollis, Okla., have been moved.

"A FIELD OF OPPORTUNITY"

THE territory served by the San Diego Consolidated Gas and Electric Company occupies the extreme southwest corner of the U. S., and comprises San Diego County and a small portion of Orange County, a total area larger than Rhode Island and containing a population of approximately 275,000.

San Diego itself is California's fourth largest city. With its 22 square miles of land-locked harbor, San Diego has become the country's largest Naval Base; while year-round favorable climate and the National Defense program have led to its development as an aircraft center of steadily increasing importance.

Noted for its semi-tropical climate, this area each year draws thousands of visitors from all parts of the world.

This Company therefore occupies a field of exceptional opportunity for development and these advantages are being aggressively promoted.

Excerpts from the Annual Report of the

SAN DIEGO CONSOLIDATED GAS & ELECTRIC COMPANY

INDUSTRY *Personalities*

A. Gordon King, service engineer with the American Gas Association for the past 17 years, was recently appointed secretary of the association Technical Section by Major Alexander Forward, managing director of the A. G. A. He succeeds the late Hugh W. Hartman.

A. G. KING

After wide experience in England, Canada and the United States, which included service in the Chemical Warfare Section of the United States Army, Mr. King joined the staff of the A. G. A. in February of 1923. His association work has variously involved field work, lectures, personnel direction and secretaryships of general committees such as those on Standards and Service, Rate Fundamentals, Aids in Aviation, Purging Gas Holders, and Gas Works Apparatus and the newly created Association Committee on National Defense.

Aside from his professional activities, Mr. King is well known as an amateur photographer whose clicking camera has pictorially reported the chief personalities and events of the national conventioins for the gas industry trade press.

Walter D. Howell, general sales department, Pacific Gas & Electric Co., San Francisco, Calif., has won, in competition with 150 others throughout the country, one of 11 fellowships awarded by the Alfred P. Sloan Foundation for 12-month courses in the Graduate School of Business Administration at the Massachusetts Institute of Technology in Boston.

Elmer F. Schmidt, vice president and operating manager of the Lone Star Gas Co., Dallas, Texas, announces that **Herman B. Dempsey,** assistant foreman of the Ranger pipe line district, was recently appointed foreman of the Ballinger pipe line district. Mr. Dempsey joined the Lone Star Gas Co. in 1931 as laborer.

Glen Carnahan, James B. Clow and Sons, Chicago, Ill., has been appointed as assistant to the executive vice president recently and will continue to supervise the gas steam department.

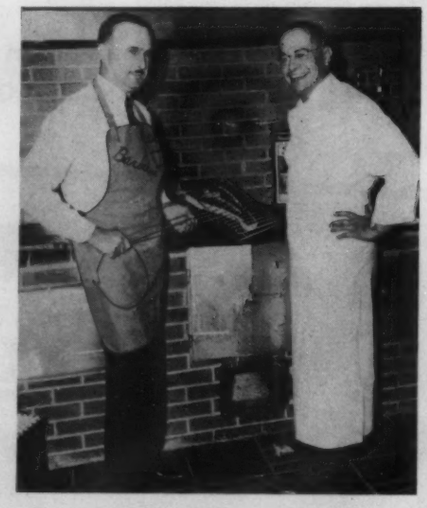
Miss Rachel Hall has been appointed home service representative of the Ohio Fuel Gas Co., Columbus, Ohio, it was announced recently by **Frederick S. Williams,** district manager. Miss Hall, who will work in the Columbus district, is a graduate of Ohio State University.

Clara H. Zillessen, advertising manager, Philadelphia Electric Co., was recently appointed chairman of the 1941 "Better Copy Contest" of the Public Utilities Advertising Association. Miss Zillessen was elected second vice president of the P. U. A. A. at the annual convention in Chicago last June.

L. V. Cassaday, general manager, Lomita Gasoline Co., Long Beach, Calif., was recently named president of the California Natural Gasoline Association for the year 1940-41. A dinner was tendered by the Lomita Gasoline Co. to the association's board of directors and committee chairman in Long Beach. **P. S. Magruder**, General Petroleum Corp., was the retiring president at a meeting of the directors following the dinner, and **George L. Tyler** was re-elected secretary of the association.

William G. Neiert, employed in the accounting department of the Monongahela West Penn Public Service Co., Fairmont, W. Va., for 22 years and who has been general auditor for the past 11 years, retired recently because of ill health. He will make his future home in Cincinnati and Florida.

W. T. Ivey, vice president of the Peoples Water and Gas Co., Meridian, Miss., was recently appointed assistant to the president of the Southern Natural Gas Co., Birmingham, Ala. **H. K. Griffin,** in charge of water operations for Peoples Water and Gas Co., will succeed Mr. Ivey at Meridian.



James T. Van Rennselaer, (left) and Otto C. Mauthe, publicity men for Southern California and Southern Counties Gas Companies, on August 14, offered their services as culinary experts for a barbecue cooking demonstration at Barker Bros. department store in Los Angeles. Some 150 barbecue fans watched with interest while Messrs. Mauthe and Van Rennselaer prepared barbecued hamburger, sauce, and Zabayons. Mr. Mauthe is a member of the Wine and Food Society of Los Angeles.

Barney S. Pederson, identified with various phases of the gas industry since 1895, recently joined the engineering department of the Ward Heater Co., Ltd., Los Angeles, Calif. Prior to his affiliation with Ward Heater he was a holder of the franchise and plant of the Coos Bay Gas Co., Marshfield, Ore., which he acquired in 1934 and sold in 1939.

B. S. PEDERSON

Mr. Pederson was born in Bergen, Norway, attended Luther College, Decorah, Iowa, and Pratts Institute of Technology, Brooklyn, N. Y. In 1896 he went to the Western Gas Construction Co., and came to the Pacific Coast in 1897 as gas works construction engineer. In 1904 he joined the American Stove Co., Cleveland, Ohio, and remained with them until 1934.

He was the third member of the Pacific Coast Gas Association admitted under the classification of engineer in 1900. In 1917 he was awarded the association's gold medal and elected a director of the association.

Professor **Otto L. Kowalke,** chairman of the department of chemical engineering of the University of Wisconsin, recently announced his retirement. Professor Kowalke's most recent of many contributions to the gas industry was the development of a method of eliminating the deposits which accumulate in gas appliance control valves. He plans to continue his activity in the interest of the gas industry, and is now engaged in further study of the problem of gum deposits.

Harry B. Van Hook has been appointed eastern manager of the Security Manufacturing Co., Detroit, Mich., according to an announcement by **William T. Rasch,** president of the company. Mr. Van Hook has had experience with the A. H. Wolff Gas Radiator Co., the American Gas Products Corp., the American Radiator Co., and recently was a specialist for the Detroit branch of American Radiator and Standard Sanitary Corp., New York, N. Y.

George W. Brian, manager of the Ohio Fuel Gas Co., offices in Urbana, Ohio, has been promoted to district manager in Indiana. His home will be in Zionsville.

J. H. Tuttle was recently elected a vice president of the Standard Oil Co., of California, San Francisco, Calif., to fill the vacancy created when **H. D. Collier** was elected president succeeding **W. H. Berg,** who died recently.

Mr. Tuttle entered the company in 1903, became assistant general auditor in 1918, assistant secretary in 1921, secretary in 1922, secretary and comptroller in 1926 and was elected to the board of directors in 1930.

Clarence P. Busche, who has been located at Ashland with the Peoples Natural Gas Co., Omaha, Neb., has been transferred to Sherburn, Minn.

George E. Frazer, counsel for the Association of Gas Appliance and Equipment Manufacturers, was recently honored with the degree of Doctor of Laws by Washburn College, Topeka, Kan., at the College's 75th anniversary. In 1918 he was assistant director of finance for the national government.

Cool Kitchen Cool Cook!

A Certified Performance *gas* range assures *happier cooking* this summer!

YOU'RE INVITED to a cooler, pleasanter kitchen—in *your own* house! A kitchen with a shining new Certified Performance gas range—that cooks the carefree way. You just relax, let the range oven-cook entire meals without attention. Superior insulation keeps heat *in* the range—*out* of the kitchen. And new-type top-burners concentrate heat on pan-bottoms—help keep the kitchen more comfortable.

GOOD LIVING WITH ECONOMY IS A KEYNOTE OF THESE OTHER GAS APPLIANCES

REFRIGERATION IS SILENT. There's no noise in a Servel gas refrigerator because there's *no motor*. You get service that is wear-proof, trouble-free—with a freezing unit *guaranteed 10 years!*

HOT WATER WHEN YOU WANT IT! Gas provides the quick heat needed for the right kind of service. It works *best* for you in a rustproof gas water heater of adequate size for your family's needs.

CONTROLLED TEMPERATURES in winter are easy with automatic gas heat. It's the healthful, convenient, economical way. Save 10%! Buy a gas furnace now during special summer sale!

You can enjoy the comforts of today's gas appliances on easy terms. See a dealer, or SOUTHERN CALIFORNIA GAS COMPANY

Your Servant **Gas**

FASTER CLEANER CHEAPER

L. F. Ryall and W. W. Hall

L. F. Ryall, sales manager for the General Gas Light Co., Kalamazoo, Mich., announced recently the addition of **W. W. Hall** to the company sales staff. Mr. Hall, with offices in the Santa Fe Building, Dallas, Texas, will represent the company in the sale of Humphrey Gas Appliances in Texas. Mr. Hall was formerly with the Ruud Manufacturing Co., Pittsburgh, Pa.

George Boeddener, former assistant to the president of the National Warm Air Heating and Air Conditioning Association, was recently elected managing director and treasurer of the association. He succeeds **Allen W. Williams,** managing director for the past 27 years.

R. I. Swift, Racine division manager of the Wisconsin Gas and Electric Co., Racine, Wis., has announced several changes in personnel in the Cudahy offices of the company. **Martin Martinsen** comes to Cudahy from Racine and will be the new local manager.

Wendell Koch will handle sales and promotion for the company. **Peter Andreason** has been transferred from Racine as general foreman and will replace **Carl Smith,** who has been transferred to the Racine branch.

Ansel B. Huyck, formerly assistant engineer of manufacture, Brooklyn Union Gas Co., Brooklyn, N. Y., was recently made engineer of manufacture, filling a vacancy created last December when **Harry L. Nickerson** was elected chief engineer.

Samuel Green, formerly works engineer, manufacturing department, was made assistant engineer of manufacture. **Edward J. Murphy,** formerly assistant chief chemist, was appointed chief chemist, a post made vacant on July 1 by the retirement of **Edward C. Uhlig.**

Mr. Huyck is a graduate of Rensselaer Polytechnic Institute and started with the company in 1928, when he was made assistant superintendent of the Greenpoint Coke Oven Plant. Mr. Green was graduated with a mechanical engineering degree from Brooklyn Polytechnic Institute. He joined the company in 1912, his first position being that of a clerk. Mr. Murphy was educated at Pratt and Brooklyn Polytechnic Institutes and entered the company's employ in 1905 as assistant chemist.

Harry J. Goldey, credit manager of the Cincinnati (Ohio) Gas and Electric Co., retired recently after 48 years of service because of ill health. He started as a clerk when 13 years of age.

J. Frank Maley, supervisor of customer accounts of Harrisburg (Pa.) Gas Co., recently completed 35 years of service with the company. He started in 1905 as a collector.

John Wilkie, vice president and treasurer of the Central Hudson Gas and Electric Corp., Poughkeepsie, N. Y., was recently elected a trustee of Vassar College for an eight-year term.

Grover C. Poust, formerly with the United Light Co., Davenport, Iowa, succeeds **J. G. Storey** as industrial salesman at Sawville, Ill. Mr. Storey was transferred to Kewanee, Ill.

Harley Higgins, Bert Wright, Mike Smith, and Fred Akers, all of the San Diego Consolidated Gas & Electric Co., San Diego, Calif., were honored with 20-year service pins recently. Mr. Wright retired on June 1, the date of his twentieth anniversary.

Chester L. May, president and general manager, Texas Cities Gas Co., Dallas, Texas, recently announced management changes at three points and the election of two new vice presidents.

Frank V. Williams, Corsicana district manager, was named Corsicana division superintendent, succeeding **Leon M. Scholl,** who was transferred to the Denison-Sherman division.

J. Y. Wheeler, Denison-Sherman division superintendent, was appointed El Paso manager. He succeeds **R. S. Reading,** who becomes Corsicana district manager for the Community Natural Gas Co., Dallas, Texas.

Fred L. Richardson, a director of the Community Natural Gas Co. since its organization, was named a vice president of that company, and J. Y. Wheeler was named a vice president of Texas Cities Gas Co.

S. L. DRUMM

S. L. Drumm, secretary-treasurer of the Southern Gas Association, was appointed general sales manager of the New Orleans Public Service, Inc., recently. Mr. Drumm has been connected with the New Orleans utility since 1925 when he was employed as industrial gas salesman.

Since that time he has held the position of gas engineer and, more recently, industrial and commercial sales manager.

J. H. MacGaregill, general manager of marketing, was elected a director filling the vacancy by the death of Mr. Berg. **B. W. Letcher,** general auditor and assistant secretary, was elected secretary and comptroller.

E. C. Cooper, salesman for the Gas Service Co., Kansas City, Mo., was recently promoted to sales supervisor at St. Joseph and will work directly under **H. S. Hicks,** new business manager of the company.

Mr. Cooper started in the utility business when he was 19 years old as a floor salesman. In 1922 he won a $50 prize in a washing machine selling contest and in 1927 sold 63 ranges during a 60-day contest. In 1931 he led all of the Gas Service salesmen for the year, selling $20,139 worth of merchandise. In 1937 he was one of the company's salesmen to win a trip to the A.G.A. convention in Cleveland, and in the past 11 years has sold more than 650 gas-fired furnaces.

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Gas is today the principal fuel for cooking purposes. It is estimated that out of the 30 million families in the United States, 16 million or more than half of them cook with gas.

OBITUARIES

Alma Freeburg

Alma Freeburg, publicity and advertising coordinator of the Coast Counties Gas and Electric Co., Santa Cruz, Calif., died recently after a long illness. She was born in Kansas, educated in California and joined the Coast Counties Gas and Electric Co. in 1929.

Frederick S. Burroughs

Frederick S. Burroughs, 52, financial vice president of the Associated Gas and Electric Co., Ithaca, N. Y., died recently of a heart attack. He was educated at the University of Wisconsin and served as chief engineer of the public service commission of Washington state before he became identified with eastern financial interests 27 years ago.

Russell Palmer

Russell Palmer, 50, publisher of a group of trade journals for the oil industry, died recently while on a vacation at La Jolla, Calif. He lived in Altadena, Calif.

Mr. Palmer was born in Pennsylvania and came to the Pacific coast 30 years ago. For many years he has been the publisher of the *Petroleum World*, Los Angeles; *World Petroleum*, New York; *Petroleum Times*, London; and various other trade journals.

A. J. Grinke

A. J. Grinke, chief clerk in the Dallas headquarters office of the Community Natural Gas Co., and the Texas Cities Gas Co., distributing units of the Lone Star Gas Co., Dallas, Texas, died recently of complications from an attack of appendicitis. He had been ill three weeks.

Mr. Grinke was graduated from the Texas Technological College, Lubbock, Texas, and joined the companies in 1928 as a draftsman.

Clarence H. French

Clarence H. French, for many years manager of the hotel equipment department of Standard Gas Equipment Corp., New York, N. Y., passed away July 4 at the age of 63.

Mr. French was considered an authority on commercial cooking problems. Early in his business career he was associated with Public Service Electric and Gas Co. of New Jersey, later returning to the William M. Crane Co., which was merged some years ago with the Standard Gas Equipment Corp. He served over 40 years with these firms.

Mr. French's son, Robert, recently joined the New York office of the company.

Jay Clarence Barnes

Jay Clarence Barnes, born May 12, 1890, at Carthage, Mo., director of advertising for the New Orleans, (La.) Public Service Inc., succumbed to a heart attack, August 15, at his country home, St. Francisville, La. He came to the company July 1, 1924. Prior to that time, since August, 1919, he was affiliated with the United States Veterans Bureau in their local office as a liason official.

Mr. Barnes was nationally known in the field of public utility advertising. He was a past president of the Public Utilities Advertising Association. He had also been head of the Advertising and Publicity Section of the American Gas Association. He was one of the prime factors in bringing the Gas Association's National Convention at New Orleans.

Preview of coming campaigns by

P·G·and E·

PACIFIC GAS AND ELECTRIC COMPANY

GAS APPLIANCE SOCIETY OF NORTHERN CALIFORNIA

NEXT MONTH—OCTOBER
A BRAND NEW IDEA IN GAS RANGE PROMOTIONS

A glance at the gas promotional schedule shows colored circles around fourteen shopping days in October. Those circles mark the period of a great all-industy gas range campaign for Northern California—a campaign in which the special buying inducements, the advertising, and the dealer tie-ins are all on a scale never before attempted. It is too early at this time to divulge the details of the campaign, but we can give dealers this assurance—it will be profitable to sell any kind of a gas range, and particularly profitable to sell "CP" and kitchen heater models. More information is coming soon in the Gas Appliance Society's campaign broadside.

G 209-940

DEALERS: By watching this page from month to month you can keep informed of sales promotional campaigns to be sponsored by the Pacific Gas and Electric Company and the Gas Appliance Society. Detailed information will be supplied, as usual, through the mail. If such information is not received, call our local office or write Gas Appliance Society, 1355 Market Street, San Francisco, California.

OIL & GAS *Equipment Review*

Reg. U. S. Pat. Off.

• **THE READER'S ATTENTION is called to the coupon in the lower right hand corner of this page. This coupon is printed for the reader's convenience and will enable him to obtain with minimum effort further information on any of the items or catalogs listed in this department. All he has to do is to "ring" on the coupon the number that corresponds to the number printed over the item in which he is interested, clip out the coupon, and mail it to GAS, 1709 West Eighth Street, Los Angeles, Calif. — Editor.**

For more information **"ring 3898"** on coupon

Hydraulic Jack

Trade Name: Model 25H10 Hydraulic Two-Speed Journal Jack.

Application: It is a compact, dependable hydraulic jack for work where raising and lowering operations must be under complete control at all times. Especially desirable for removing railroad car journals.

Features Claimed: The jack is completely hydraulic. It has two speeds, fast for medium and light loads, and a second speed for heavy loads. Positive stop at limit of rise, making it impossible for ram to bind in cylinder at limit of rise. The ram is made of solid bar stock. The jack has a swivel handle, making it easy to carry. Its capacity is 25 tons with a 6-in. rise, and the height of the jack closed is 10 in.; weight, 45 lbs.—*The Buda Co., Harvey, Ill.*

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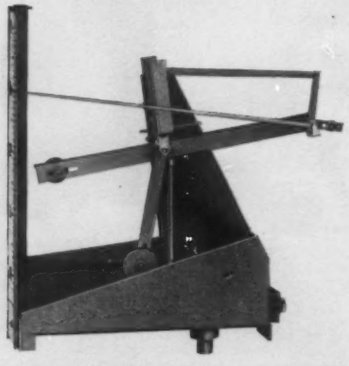
For more information **"ring 3899"** on coupon



Draft Gage

Trade Name: Ellison Straight-Line Diafram Gage.

Description: The gage has a high power, free floating diafram, with travel of from .25 to .6 in. and a displacement of not less than 10 cu. in. at 1 in. pressure. Location of diafram on the bottom of the gage casing, suspended through a ball joint from the knife edge eyelet bearing results in a perfectly mechanized diafram movement. The diafram fabric consists of a fine mesh, pure silk cloth, of high strength, coated with a pliable and airtight synthetic coating—the most satisfactory diafram material for high power diafram gages. The fabric has $\frac{3}{16}$-in. excess slack at each end of stroke—shrinkage tension eliminated. For minus pressures, the draft line connects with the bottom of the diafram casing, the connecting rod passing through the top of the casing. For plus pressures, the draft line connects with the top of the diafram casing, the connecting rod movement operating through the bottom by means of a metal link around the casing—no sealing diafram required. For differential pressures, the draft line connects with the top of diafram casing for the high absolute pressure, and with the bottom for the low pressure.—*Ellison Draft Gage Co., 214 W. Kinzie St., Chicago, Ill.*

■ ■

For more information **"ring 3900"** on coupon

Humidistat

Trade Name: Insertion Humidity Control, Type H/61.

Application: For use under conditions of dust, dirt and other adverse service conditions.

Features Claimed: The control features the Friez multiple human hair element, and a switch mechanism fully enclosed in a molded plastic case. Suitable for use in bakers' proof-boxes, incubators, low-temperature ovens, test cabinets and similar applications.—*Julien P. Friez & Sons, Division of the Bendix Aviation Corp., Baltimore, Md.*

■ ■

For more information **"ring 3901"** on coupon

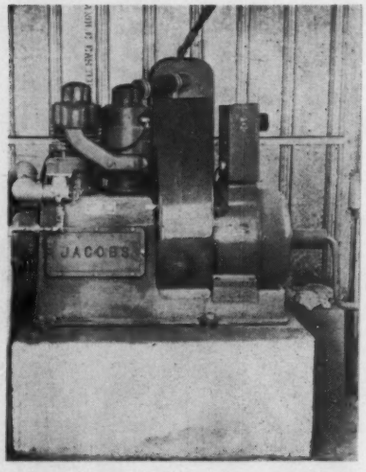
Cathodic Protection Unit

Trade Name: Jacobs Special Natural Gas Engine Unit.

Application: Designed and developed for the prevention of electrolysis on natural gas pipe lines.

Description: Unit shown is one of a series installed by the Panhandle Eastern Pipe Line Co., this one near Newton, Kan. This engine takes care of about 10 miles of 24-in. gas line acquiring about 1800 watts of current.

Features claimed: The unit has slow speed, few moving parts, and is extremely simple. Annual maintenance cost is very low and it is only necessary to inspect unit four times a year. Constant level oil system but no oil



pump to wear out, clog or cause trouble. It has no valves or gears, which are two of the most troublesome and expensive maintenance parts on most engines. This unit can also be obtained for gasoline operation on gasoline and oil pipe lines. Complete engine protection is secured by automatic ignition control that stops engine in the event of over-speeding or low oil in the reserve tank. — *Jacobs Wind Electric Co., Inc., Minneapolis, Minn.*

■ ■

For more information **"ring 3902"** on coupon

Model Plastic

Trade Name: Lucite and Plexiglas.

Application: Used in the making of transparent models for sales or display purposes by manufacturers of equipment.

Description: Lucite and Plexiglas are both strong and tough, yet light in weight. They are clear and possess a white brilliance free from yellow haze or cast. In addition, the surface of these materials will not easily chip. Lucite and Plexiglas are available in a wide range of colors which are transparent yet brilliant in tone. Another factor

This coupon will bring you further information, catalogs, etc., concerning products described in the Oil & Gas Equipment Review Department of GAS. "Ring" the numbers of items which interest you, sign and mail this coupon to **GAS, 1709 West Eighth Street, Los Angeles, Calif.**

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September, 1940

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in the construction of models, either stationary or working, is that when the functioning of a part is dependent upon the material of which it is made, such as a rubber seal, bronze thrust ring or steel valve spring, the actual material can be used, as Lucite or Plexiglas are unaffected by and do not affect other substances. The valve shown in the illustration is an example of the complex type of units it is possible to fabricate of Lucite and Plexiglas. This valve is 10 in. high and yet weighs only 4 lbs. It is constructed entirely of transparent plastic even to the spring which is sufficiently flexible to be compressed to illustrate its action. — *The Transparent Plastics Product Co., 428 Boyd St., Los Angeles, Calif.*

■ ■

For more information **"ring 3903"** on coupon

Timer

Trade Name: Taylor Flex-O-Timer.

Application: For all-electric, all-pneumatic operations, or combinations of both, permitting precision of timing with minimum labor and expense.

Description: Cam cutting is eliminated and the actuating pins are easily adjusted in circumferential undercut grooves on the one-piece drum and locked in place with a screw. The air valve or switch can be turned on or off within one-half of total cycle times by means of this adjustability. A latch-trip solenoid operated mechanism starts the process instantly. This actuates one or more snap operators to start the timer motor which is of the high torque, fan cooled synchronous type, and many outside electrical or pneumatic functions to be performed simultaneously at the start of the cycle. An external push button or limit switch can be used to provide the electrical contact to start this process. A new type low leak air valve utilizes 99½% of the air passed through it. The air valve plunger is so designed that the air supply port cannot communicate with the exhaust port, assuring rapid and full air pressure application and release. Dirt particles are sheared off by the close fit of the piston, then exhausted from the system, making the valve practically self-cleaning.—*Taylor Instrument Companies, Rochester, N. Y.*

■ ■

For more information **"ring 3904"** on coupon

Heat Control

Trade Name: Republic Gradient-Heet Control.

Application: For modulated heating on conversion burners.

Features Claimed: With Gradient-Heet Control the gas input to the burner is normally maintained at a low stage, adjustable to suit the installation as long as the room temperature is between a high and low limit. If the room temperature decreases to the low limit, the Gradient-Heet Control increases the gas input and sustains this higher input until the room temperature rises a fraction of a degree. Should the room temperature ever reach the high limit, the gas input is shut off completely. With the control, the heat input is continuous except in mild weather, resulting in increased comfort, since the chances for stratification and over-shooting are minimized. The control is extremely simple in design and construction and permits the unaltered use of standard thermostats and control valves. — *Republic Heaters Sales Co., 2258 Diversey Parkway, Chicago, Ill.*

Before You Buy, Consult the *Latest Trade Literature* Concerning Equipment

This department of GAS will gladly mail you without obligation any of the selected bulletins listed below. Use the coupon on page 68 of this issue, indicating by number above those you desire.

For more information **"ring 3905"** on coupon

Republic Steel Corp. has just released a four-page, letterhead size folder which contains a table listing the analyses and properties of 13 of the most popular types of Enduro Stainless Steel. The folder is identified as Chart 381.

For more information **"ring 3906"** on coupon

The Brown Instrument Co. has just published a new Catalog No. 6705 on thermometers and pressure gages. The catalog covers the complete line of Circular Case Thermometers, pressure gages, indicators, recorders, and controllers.

For more information **"ring 3907"** on coupon

Announcement is made by Mine Safety Appliances Co. of a new descriptive bulletin dealing with the application of the All-Vision Facepiece to the company's line of Hose Masks. The bulletin is entitled M. S. A. Hose Mask Bulletin No. EB-4.

For more information **"ring 3908"** on coupon

Bulletin No. 40 describes the inexpensive H & G Solid Adjustable Heads that use the same high speed insert chasers as are used in the opening die heads. Printed by the Eastern Machine Screw Corp.

For more information **"ring 3909"** on coupon

A 12-page booklet has been published by the Link-Belt Co., and contains complete price and dimensional data on flexible couplings.

For more information **"ring 3910"** on coupon

Fairbanks-Morse Figure 5135 rotary pumps are illustrated and described in Bulletin No. 5135.

For more information **"ring 3911"** on coupon

The Condenser Service & Engineering Co., Inc., has just published a new catalog entitled "Lubricating Oil Cooler Catalog No. 31."

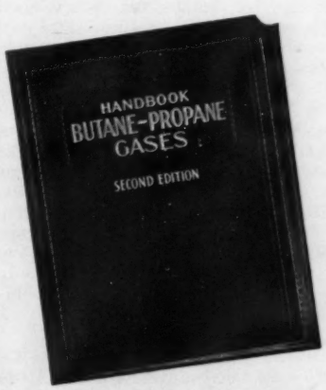
For more information **"ring 3912"** on coupon

"How to Save on Casing With Safety" is the title of A. O. Smith Corp.'s Bulletin No. 537, and contains 27 pages of illustrative material.

For more information **"ring 3913"** on coupon

Several types of valves are described by the Homestead Valve Mfg. Co., in a four-page folder.

HANDBOOK BUTANE-PROPANE GASES



415 Pages

CONTENTS: Semi-Bulk Distribution: Use of Butane in Buses: Combination Propane Operated Utility Plant: Use in Internal Combustion Engines: Design and Installation of Storage: Supply from Petroleum Refineries: Engineering Data on the Lower Olefins: Domestic Appliance Testing and Utilization: Economical Comparisons with Coal, Oil, Electricty, Producer Gas, Manufactured Gas: Town Plants: Manufacture from Natural Gas: Specal Uses: Volume Correction Factors: Transportation: Use with Other Gases: Analysis and Testing: Properties of Mixtures: Bottled Gas Distribution: Bibliography: Central Plant Directory: Catalog Section.

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CURRENT Reading

New Dehydration — Refrigeration Plants Involve Use of Diethylene Glycol — H. L. Flood. *Petroleum Engineer*, May, 1940, pp. 113, etc. One of the most interesting applications of diethylene glycol as a means of reducing the water content of natural gas has just been made in the K.M.A. field, near Wichita Falls, Texas. Installation of the equipment in which the water extraction is accomplished has just been completed by Continental Oil Co. in the three gasoline plants owned by the company and operated in connection with the cooperative repressuring project in which more than 300 operators participate. Absorption of water by the glycol in combination with refrigeration by propane results in a gas having a dew point of plus 4° at 1800-lb. pressure.

Annual Report of the Petroleum and Natural Gas Division (for the fiscal year 1939) — R. A. Cattell, chief engineer, and others, Bureau of Mines. The book discloses evidence of consumer benefits from the expanding technology of petroleum and natural gas, and deals with the advances made in the technique of drilling, producing, transporting, and refining. In non-technical language, the volume covers physicochemical properties of natural hydrocarbon mixtures; the pressure core barrel; flow of air and gas through porus media; molecular weight determinations; catalytic hydrogenation of pyrolytic tars; disposal of oil field brines; and many other specific problems.

Characteristics of Air Cleaners Used on Diesel and Gas Engines—W. K. Gregory. *Diesel Power*, July, 1940, pp. 592-595. Part 1. The primary function of an air filter or air cleaner is obviously to remove abrasive dust from the air, thereby eliminating wear on pistons, piston rings, cylinders and bearings which would otherwise occur. Other factors must be considered, however, which are equally as important as cleaning efficiency. A practical air cleaner must have: (1) A high cleaning efficiency; (2) a sufficiently low resistance to air flow so as not to appreciably reduce power delivery; and (3) it must be so designed that it can be kept in serviceable condition with a minimum amount of attention and expense.

Direct Solution for Pipe Capacity — Dr. J. R. Zwicki. *Power*, Mar., 1940, pp. 147-149. Rational method of computing friction loss for fluids flowing in pipes takes out most of the guesswork in finding proper "friction factor." Graphical construction avoids trial and error.

Retrograde Condensation — D. L. Katz and F. Kurata. *Industrial and Engineering Chemistry*, June, 1940, pp. 817-827. The paper presents the phase behavior of simple and complex substances, including laboratory results on the phase relations of a mixture of natural gas and natural gasoline. The development of the concepts of vapor-liquid equilibria indicates that much of the phase behavior observed by the early investigators has not been utilized in present-day developments. The use of the term "retrograde condensation" is discussed; simple rules for nomenclature are recommended, which indicate that phase behavior may be adequately and probably more accurately described without the use of the term. The significance of "retrograde condensation" in the petroleum industry is indicated.

The Corrosion of Iron and Steel—J. C. Hudson, 319 pages, cloth, halftone illustrations, charts and tables. Published by D. Van Nostrand Co., Inc., 250 Fourth Ave., New York. Price, $5.75. General non-technical account of the work of the Corrosion Committee of the Iron and Steel Institute and the British Iron and Steel Federation from the data compiled by the committee. Discusses rust, protection by paints and coatings, rusting in air and salt water, fundamental research and "What Remains to Be Done in Preventing Rusting." Conclusions as to causes of corrosion and recommendations for preventing corrosion are given.

Recent Developments in Pipe-Line Construction—F. H. Love, *Petroleum Engineer*, Midyear, 1940, pp. 44, etc. Although progress in the methods by which pipe lines are designed and constructed may not be measured tangibly over any specific period of time, one significant factor to be noted in the construction projects undertaken during the last year has been the manner in which all the knowledge gained in the past concerning good practice has been coordinated to produce pipe-line systems that attain maximum efficiency both in the process of construction and in the operation and maintenance of the completed line. Author notes a few of the more significant developments.

Review of Recent Contributions to Study of Pipe-Line Corrosion—Dave Harrell. *Petroleum Engineer*, Midyear, 1940, pp. 127-130. A review of several vital contributions made in the past year to the general technique of corrosion prevention in the pipeline industry. Application of Electrical Protection; Results of Cathodic Protection Installations; Dr. Ewing's Studies; Microbiological Anaerobic Corrosion.

The Valuation of Oil and Natural Gas Properties as Distinguished from Mines —L. F. Terry. *Mining and Metallurgy*, May, 1940, pp. 227-230. In valuing an oil or natural gas producing property, the engineer first estimates the recoverable reserves. The production for each future year is then forecast after giving considerations to the size of the total reserves, the producing capacity, the effect of proration, and, especially with gas properties, the problem of market outlets. The future revenue and the costs of development, royalties, operation, and overhead are estimated, to arrive at the net revenue for each year. Finally, the present worth of future net revenues is computed by applying to the amount estimated for each year a factor representing a sum which, if invested from the date of valuation to that year with compound interest at a stated rate, will amount to one dollar. The total of these discounted future net revenues represents the value of the property on the basis of the assumptions adopted.

"Typical Specifications for Surface Condensers and Auxiliaries for Turbine Service"—Published by Heat Exchange Institute, 90 West St., New York, N. Y. This publication is designed as a guide to purchasers of surface condensers. The "Typical Specifications" is similar in form to a checklist so as to insure that complete information is supplied by purchasers to manufacturers. Use of the "Typical Specifications" will enable the manufacturers to design a surface condenser to meet purchaser's specific requirements.

Instruments for "Logging" and Sampling Oil and Gas Wells While Drilling — J. T. Hayward and L. M. Swift. *Instruments*, June, 1940, pp. 155, etc. Instruments — more than 20 of them installed in a trailer — are the basis of a new method of obtaining data. The "Baroid Well Logging Service," described in this article, not only gives accurate data on the content and depth of the sands to be obtained, but gives the operator additional data which enable him to drill more intelligently and generally at reduced expense.

"Lessons in Arc Welding"—Published by The Lincoln Electric Co., Cleveland, Ohio. 144 pages, 6x9 ins.; over 100 illustrations, including photos and drawings. This book consists of a series of 51 lessons, based upon experiences of Arthur Madson, instructor of the Lincoln Arc Welding School, presenting in concise manner fundamental facts of welding. The 51 lessons are covered in four principal sections: Welding with Unshielded Arc Electrodes; Welding with Shielded Arc Electrodes; Electrodes for Particular Joints and Metals; Hardfacing.

Chart for Computing Volumes — *Oil and Gas Journal*, July 11, 1940, p. 65. In computing the volume of gas being injected into input wells in pressure maintenance and repressuring operations or gas produced at the casing head to obtain gas-oil ratios, as well as many other uses, usually operators make use of extension tables or apply arithmetical formulæ. To do so requires considerable time, and in many instances the tables are not available in the field or the personnel thoroughly familiar with their use. Thus in order that the gas volumes might be more easily computed, "Ty" Davison, engineer for Jo Cable, repressuring engineer of Wichita Falls, Texas, devised the chart shown in this article.

Capital Goods Industries and Federal Income Taxation — *Machinery and Allied Products Institute*, 221 N. LaSalle St., Chicago, Ill. A research report disclosing alleged discriminatory effects of Federal tax laws, with recommendations for correction. The report suggests changes in income tax procedure so that corporations manufacturing durable goods will be allowed a six-year carry-over period to equalize profits and losses.

Vertical Conversion Gas Burners — L. S. Reagan. *Heating, Piping and Air Conditioning*, June, 1940, pp. 362-366. Application to Large Heating Boilers and Control. This discussion deals with the selection and

application of burners and controls for utilizing natural and mixed gas. It covers vertical conversion burners for heating boilers of the larger sizes used in industrial, commercial and institutional buildings.

Capital Expansion, Employment, and Economic Stability — Harold G. Moulton, George W. Edwards, James D. Magee, and Cleona Lewis. Published by *The Brookings Institution*, Washington, D. C. This book (413 pages; tables and charts; cloth bound; and priced at $3.50) reports on a two-year investigation of factors responsible for stagnation of American capital markets. Typical findings: new flotations have been reduced to one-eighth the former total; state and local government bond issues are limited; federal bond issues are three times as great; individual money savings have been cut in half; corporate savings have become negligible; investment yields have declined 40%; small corporations have a definite shortage of working capital.

Mobilizing Civilian America—Harold J. Tobin and Percy W. Bidwell. Published by Council on Foreign Relations, 45 East 65th St., New York, N. Y. A report on a two-year study of America's World War No. 1 experiences with wartime relationships between people, government, and business, and an analysis of mobilization plans to become effective "M-Day." The volume is concerned with past and prospective conscription for military and industrial service, control of public opinion through propaganda and censorship, control of production and prices, government operation of transportation and communication facilities, and taxation.

Specific Heat Ratios for Hydrocarbons — W. C. Edmister. *Ind. and Engr. Chem.*, Mar., 1940, pp. 373-375. A chart is presented for estimating C_p C_v (γ) ratios for methane, ethylene, ethane, propylene, propane, isobutylene, isobutane, 2-butane, *n*-butane, isopentane, *n*-pentane, benzene, diisopropyl, *n*-hexane, *n*-heptane, diisobutyl, and *n*-octane at reduced pressures up to 1.2 and at reduced temperatures up to 2.5.

Nitration of Ethane — H. B. Hibshman, E. H. Pierson and H. B. Hass. *Ind. and Engr. Chem.*, Mar., 1940, pp. 427-429. This study of the nitration of ethane was undertaken because certain derivatives of nitromethane and nitroethane are high explosives. By a suitable combination of this synthesis with other known processes, it is now possible to produce these high explosives from air, steam, and natural gas the ultimate raw materials.

Notes on Combustion Calculations — C. W. Messersmith. *Power Plant Engineering*, July, 1940, pp. 44, etc. Part 2 and last. Application of the molar system of calculating combustion problems is made to gaseous fuel in this article.

Modern Drilling — W. C. Bailey. *California Oil Fields*, April, May, June, 1938, pp. 12-36. The purpose of this article is to assist those who wish to improve their drilling technique; mentions and explains some of the recent ideas and mechanical improvements made in the manner of drilling oil wells; is a combination of ideas and practices of many successful operators; covers mud circulating plants; steam power plants; general equipment; deep drilling rotary equipment; prime movers; drill pipe and casing; bits and special tools; derricks; instruments; formation testing; turbo drill; gravel packing; controlled-pressure drilling.

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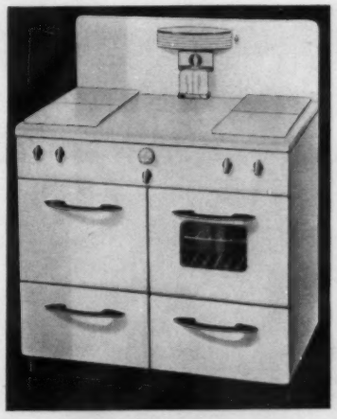

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Recent Developments in Recycling Operations—Emby Kaye. *Petroleum Engineer.* Midyear, 1940, pp. 116, etc. The three primary operations may be described as: (1) The mechanical refrigeration and retrograde process; (2) The regenerative cooling and retrograde method, and (3) The absorption process operated at high pressure. In some plants combinations of these processes have been found desirable and were installed. Plants in operation, under construction, or definitely planned as of the date of this issue are listed in a table.

High-Pressure Recycling Plant Operating at Agua Dulce—H. F. Simons. *Oil and Gas Journal,* July 4, 1940, pp. 30, 31. The Agua Dulce field in southwestern Nueces County, Texas, has recently become an important recycling center in the Gulf Coast area, with four plants in operation at the present time and a fifth under construction. Most recent installation to go on stream is the high-pressure plant of the Lockhart Oil Co. of Texas, which has a capacity of 25,000,000 cu. ft. daily. Yield from the plant is approximately 30,000 gals. of finished products daily, with the dry gas being injected into the producing formation.

Oil Is Where You Find It—Sam Mims, 236 pages, cloth. Published by Marshall Jones Co., Boston, Mass. $2.50. Written from the point of view of the human side of the oil game, the volume is concerned especially with oil-field developments in Louisiana, and with the folks who do the physical work of developing.

Gravel-Packing Injection Wells for Recycling Gas Is Important Phase of Completion — H. L. Flood. *Petroleum Engineer,* June, 1940, pp. 53-54. Before putting injection wells into operation, they are underreamed and gravel-packed in order to obtain low injection pressures when returning large volumes of gas.

The Behavior of Oil and Gas Under High Pressures and Temperatures — H. T. Kennedy. *Petroleum Engineer,* June, 1940, pp. 117, etc. Part I. Analysis of high-pressure gas-oil equilibria may indicate relative position of well in the reservoir and thus determine future drilling and proper methods of production.

Properties of Flammable Liquids, Gases and Solids—*Industrial and Engineering Chemistry,* June, 1940, pp. 880-884. The table gives pertinent data as to the fire hazard of liquids, gases, and solids found in industrial plants. It has been assembled from the results of tests made by the Factory Mutual Laboratories and from other data carefully chosen as the most reliable.

Modern Practices in the Dehydration of Natural Gas — T. S. Bacon. *Petroleum Engineer,* Midyear, 1940, pp. 82, etc. Refrigeration; Inorganic Brine Absorption; Absorption by Organic Liquids; Adsorption; Costs; Selection of Method.

Modern Practices in the Protection of Pipe Lines Against Corrosion — Starr Thayer. *Petroleum Engineer,* Midyear, 1940, pp. 131-133. This article describes the different methods used in minimizing corrosion losses.

Conversion of Petroleum: Production of Motor Fuels by Thermal and Catalytic Processes — A. N. Sachanen. Published by Reinhold Publishing Co., 1940.

Dangerous Gases in the Petroleum and Allied Industries — A series of papers presented at a meeting of the Institute of Petroleum, London, March 14, 1939. Published by the Institute of Petroleum, London, England, 1939.

Aerial Surveys in Pipe-Line Reconnaissance — H. T. Bruce. *Petroleum Engineer,* Midyear, 1940. pp. 88, etc. Aerial maps serve as a rapid means of determining pipe-line routes, facilitating purchase of rights-of-way and progress of construction.

Laws of Fluid Flow in Rough Pipes—J. Nikuradse. *Petroleum Engineer,* July, 1940, pp. 38, etc. Part 4. Experimental work extends the determination of friction factor, f, into the region of flow conditions of existing high-pressure transmission lines.

Petroleum Exploration by Means of Soil Analysis — J. W. Merritt. *Oil and Gas Journal,* June 13, 1940, pp. 68-69. A brief explanation of this method of petroleum exploration.

University of Illinois Bulletin Series No. 290—by A. P. Kratz, M. K. Fahnestock and S. Konzo, Jan. 1, 1937. Investigation of Summer Cooling in the Warm-Air Heating Research Residence.

Protective Coatings on Aboveground Pipe-Line Structures — C. F. Rassweiler. *Petroleum Engineer,* Mar., 1940, pp. 183-186. This article is confined to the vitally important problem of protecting the exterior surfaces of aboveground metal structures associated with pipe-line operation.

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U. S. Helium Plant Produces 100 Million Cubic Feet

THE world's only operating helium plant maintained by the United States Government near Amarillo, Texas, has completed producing 100 million cu. ft. of helium, Secretary of the Interior Harold L. Ickes has been advised by the Bureau of Mines.

The plant is prepared to meet any demands probable for helium from the United States Army or Navy in the national defense program. Helium, a non-explosive lighter-than-air gas, is of particular military value for airships. Action by the Secretary of the Interior in a peace-time controversy over a year ago precluded foreign accumulation overseas of any United States helium of military significance.

Figures just compiled by the Bureau of Mines show that the Government plant has produced 100,012,000 cu. ft. of helium during its operating life of a little more than 11 years. This production is less than 50% of the potential output for an equal period if the plant were run at its rated capacity. Altogether, the government has produced nearly 150 million cu. ft. of helium, as 48 million cu. ft. were produced at Fort Worth, Texas, before the Amarillo plant was in operation.

■ ■

Construction Planned For Gas Purification Plants

The Girdler Corp., Louisville, Ky., announces that several new Girbotol purification plants have recently been installed or are now under consideration.

In West Virginia, plants for the removal of hydrogen sulfide from natural gas have recently been completed by both the United Carbon Co., Charleston, W. Va., and Godfrey L. Cabot, Inc., Boston, Mass., while the United Fuel Gas Co., Charleston, W. Va., has converted its dehydration plant at Cilo to a combination dehydration-desulfurization unit. Another natural gas purification plant is that of the Tri-Ess Corp., recently placed in operation in the Amargoza field in Texas.

■ ■

Kentucky Natural Gas Corp. Opens District Office

The Kentucky Natural Gas Corp., Owensboro, Ky., recently opened a district office at 729 Ohio St., Terre Haute, Ind., to superintend distribution of gas in Riley, Paris and Mattoon, Ill., and companies served by the Universal Pipe Line Co.

The company will serve natural gas, through subsidiary companies to several communities near Terre Haute. *(G A S*, August, 1940, page 18.)

■ ■

Wildcat Well In Alberta

The Home Oil Co. has a wildcat well in the Alberta foothills area, 150 miles northwest of Calgary, Canada, which is stated to be making 9,000,000 cu. ft. of natural gas with a sizeable quantity of natural gasoline. The natural gasoline is of 50 to 55° gravity and the amount is as yet undetermined.

■ ■

New Holder For Cincinnati

The Cincinnati Gas and Electric Co., Cincinnati, Ohio, will spend $84,000 to rebuild a 1,308,000 cu. ft. four-lift water-sealed gas holder in Cincinnati. It will be completed in October, according to M. J. Pfeiffer, departmental superintendent for the company.

Marking 50 years of service to the oil, gas and allied industries

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And Klixon Gas Valves **are silent** — no hum, no chatter, no sticking. For Klixon Gas Valves have **no** solenoids. Operation is by a sure, scientifically calibrated disc. Paired with Klixon disc-operated room thermostat, you get perfect snap-acting control for your gas heaters. Valve sizes — 3/8" to 1 3/4" I. P. S. through 1000 cu. ft. Thermostats in many attractive finishes. Write for complete details, including our new **lower** prices.

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A. C. A. Testing Laboratories Distribute Bulletin on Gas Range Research

BULLETIN No. 8 on Domestic Gas Range Research was distributed on August 15 to gas company and domestic range manufacturer company members of the American Gas Association. This bulletin is based on data compiled at the A.G.A. Testing Laboratories in Cleveland.

This bulletin, representing five years investigation on domestic gas ranges, contains results of studies completed on gas ranges since issuance of Bulletin No. 7 in 1936 as well as a summary of the more important information included in this latter publication. The new data presented are confined to problems common to all types of domestic ranges and include such fundamental subjects as oven insulation, æration of burner flames, venting of flue gases, combustion, speed, and economy of operation.

Oven sections (Chapter I) covers æration and venting of ovens. Relationship of flue outlets, secondary air openings, and openings in the bottom sheet are shown in their effect on preheating, and maintenance rates and other performance characteristics. Further, a definite relationship was shown to exist between these factors and per cent excess air in the flue gases and an equation was derived expressing it.

Another phase studied was oven heat distribution. Since color of baked food products is employed as an indication of evenness of oven heat distribution, a photoelectric reflectometer was designed and constructed to provide an accurate method for measuring difference in surface color. Color evaluations thus obtained in terms of per cent reflectance were found to be far more accurate than those obtained visually. A third investigation on settling characteristics of insulating materials revealed that this factor could be eliminated by choosing the correct density of insulating material for a given range wall height.

Results of investigations of venting and æration of broiler sections (Chapter II) substantiated conclusions arrived at on oven sections. Data obtained have been applied to three types of broilers, namely, those using the same burner as the oven, separate broilers using an individual burner, and broilers with a burner located in top of the oven compartment. In addition, this section includes consideration of smokeless broiler pans and a study of automatic ignition problems.

Two investigations on top burner sections of domestic ranges (Chapter III) included in Bulletin No. 8 cover effect of venting height and utensil size on combustion and limitations affecting top section design. Consideration was given to design requirements in order to provide acceptable combustion as well as satisfactory thermal efficiency under extreme conditions of use established by wash boilers and smaller sized rigid bottom pans.

Copies are available at the A. G. A. Testing Laboratories, 1032 East 62nd St., Cleveland, Ohio.

■ ■

PSC Approves Merger

The Public Service Commission recently approved the merger of the Petersburg Natural Gas Corp. with the Wabash Public Service Corp., Vincennes, Ind.

SELL EQUIPMENT THAT IS *Twice Tested*

● Durability—Performance—Economy—are *twice assured* in *PAYNE* Gas-Fired Furnaces . . . first by AGA "Blue Star" approval, then by the endorsement of our own relentless "Proving Grounds", the *PAYNE* Testing Laboratory. Thus, every *PAYNE* owner is an enthusiastic user of comfortable, economical gas heat. ☆ There is a style and size of *PAYNE* Furnace for every house in town. Recommend—Merchandise—Sell *PAYNEHEAT* in your territory.

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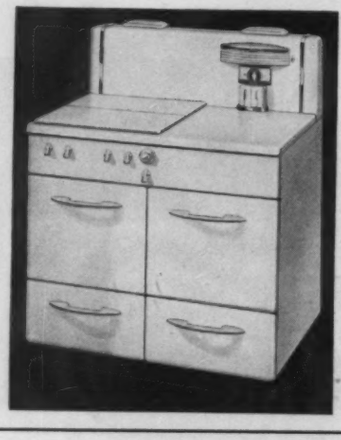

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Flush to the wall in two fast-moving popular-priced models — Detroit Jewel and Garland. Every utility is looking for an up-to-the-minute line to push sales and profits higher. Here they are, with all the selling prestige of a 76-year reputation for leading quality and value.

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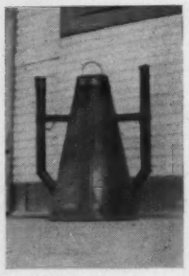
DETROIT-MICHIGAN STOVE CO., DETROIT

Lone Star Man Finds Water Heater Used in 17th Century



M. A. Tracy, tax department, Lone Star Gas Co., Dallas, Texas, on a trip to Louisiana found, in the state museum at New Iberia, a 17th century water heater taken from the house of Gabriel, the Acadian lover made famous by Longfellow.

"This old copper water heater weighs about 75 lbs.," Mr. Tracy said, "and is one of the several relics in the museum which were supposed to have been used by Evangeline's people. The copper receptacle is constructed with a hollow core where live charcoal is deposited."

After the heater had reached a fairly high temperature, it was lifted into the bathtub, which had already been filled with water. Modern water heaters have reversed this process, and now bring the water to the heat, rather than the heat to the water.

■ ■

Dehydration Plant Installed On Michigan Gas Line

A Blaw-Knox dehydration plant has been installed and is operating at the head end of Dow Chemical Co.'s 55-mile natural gas line to its main plant at Midland, Mich., is rated at 5,000,000 cu. ft. of gas per day at a gage pressure of 325 lbs. and an inlet temperature of 110° F., removes, under certain conditions, over 750 lbs. of water per day, according to reports.

The underground main line temperatures in upper Michigan are low in winter, and the plant prevents deposit of condensed water in the line because of the high sulphur content of this gas. The H_2S content is frequently as high as 320 grains per cu. ft.

■ ■

Cincinnati Gas & Electric Lowers Submarine Lines

Lieut. George Kumpe, assistant U. S. Engineer, Cincinnati district of the Ohio river division, announces that the Cincinnati (Ohio) Gas and Electric Co. is lowering its submarine gas lines across the Ohio river to a depth of 16 ft. The lines carry gas from the West Virginia coal fields to the East End gas plant in Cincinnati and were left near the 9-ft. cool stage when the navigation channel was widened last fall.

■ ■

N.G.A.A. Will Hold 1941 Convention In Dallas

According to William F. Lowe, chairman, Natural Gasoline Association of America, the N.G.A.A. will hold its 1941 convention in Dallas, Texas, instead of Tulsa, Okla., as usual. Officers of the association are George P. Bunn, Bartlesville, Okla., president; J. R. Jarvis, Dallas, and Ray E. Miller and J. W. Vaiden of Tulsa, vice presidents.

■ ■

Two New Missouri Wells

O. M. Evans, Tulsa, Okla., has drilled in two shallow 410-ft. gas wells, one producing 2,500,000 cu. ft. and the other an estimated 3,000,000 cu. ft., in Caldwell County, Mo.

Rely on Reliance

For variety of types and range of sizes—
For ease of installation and freedom from maintenance expense—
For accessibility of valve seats without removing the body from the line—
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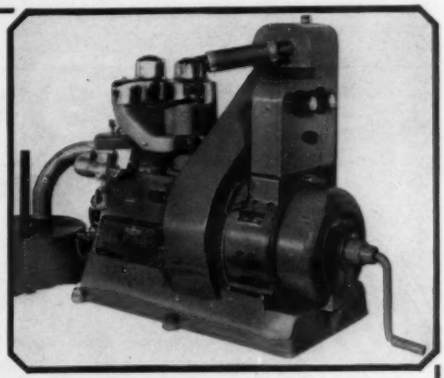
Designed exclusively for cathodic protection of pipe line. Manufactured completely in our factory. Operates on natural gas or gasoline. Few moving parts—no valves, gears, belts or pumps to break down. Positive lubrication and temperature control. Lowest operating and maintenance costs on record. *Unconditionally guaranteed for one year!*



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The JACOBS WIND ELECTRIC CO., Inc.
PIPE LINE DIVISION MINNEAPOLIS, MINN.

Natural Gasoline Plants in the U. S.

By G. R. HOPKINS and E. M. SEELEY*

INDICATIONS that the concentration* of natural-gasoline manufacture in fewer establishments, which has been in progress for more than 10 years, has lost much of its impetus is evident in the biennial survey of the Bureau of Mines, United States Department of the Interior, for January 1, 1940. This survey shows that there were 729 plants on that date, or only 12 fewer than on January 1, 1938. Of the number, 671 were operating and 58 were shut down on January 1, 1940. The number of plants in Oklahoma continued to decrease rapidly, but this was largely offset by a sizable gain in Texas and a smaller gain in Illinois, which, until the recent oil boom, had shown a steady decline.

The total daily capacity of the plants on January 1, 1940, was 11,662,000 gals., the highest ever recorded. Although the capacity increased 579,000 gals. (5%) between January 1, 1938, and January 1, 1940, this gain was much less than in 1936 and 1937, when the price of natural gasoline was much higher.

The natural-gasoline industry is materially overbuilt, much more so than even petroleum refining. This condition is due to a hold-over of old capacity built before proration, as well as to continuance of the practice of building up to peak gas production. In 1938 and 1939 the operating units worked at only 53% of capacity compared with about 60% in 1937.

The share of Texas in operating capacity increased in 1938-39 and that of both California and Oklahoma decreased. These three states had 84% of the total operating capacity on both January 1, 1938, and January 1, 1940. The number of oil wells in the East Texas field did not increase nearly as much in 1938 and 1939 as in the previous two years, but the daily capacity rose from 615,000 gals. January 1, 1938, to 929,000 on January 1, 1940. On the other hand, the capacity in the Panhandle, the leading producing district of the country, declined slightly in 1938-39.

The principal change concerning types of plants was the appearance of recycling plants. In general these plants process the gas for "condensate" and return the residue gas to producing formations. There are supposed to be about a score such plants (all in Texas), but only 10 of 246,000 gals. capacity were so designated in the returns for January 1, 1940.

■ ■

*Mr. Hopkins is assistant chief economist, Petroleum Economics Division, Bureau of Mines; Mr. Seeley, statistical clerk, Petroleum Economics Division, Bureau of Mines.

*Reprinted from Bureau of Mines Information Circular 7126.

REDUCES 100 POUNDS TO MEDIUM OR LOW PRESSURE

Fulton Toggled Reducing Regulator

The tank or transmission line may carry 100 pounds or more of pressure and you can reduce it to medium or low pressure in your distribution system with the Fulton Toggled Reducing Regulator. Can be adapted for either natural or manufactured gas. Also for by-product coke oven gas. For reversing furnaces, equipped with oversize valves. Gives definite and sure control. Circular 2573, on request.

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Pacific Gas & Electric Co. May Cut Consumer Rates

Pacific Gas and Electric Co., San Francisco, Calif., is working out new schedules to go into effect in October, reducing the gas and electric rates of consumers in Northern California by approximately $5,000,000 per annum.

While a definite schedule has not yet been worked out, it is expected a $3,000,000 saving will be made in gas rates for both domestic and commercial consumers in Northern California. San Francisco consumers will save $750,000.

In 1939 Pacific Gas and Electric Co. rates were reduced $3,200,000 a year; in 1938 a $2,000,000 cut was effected, and in 1937 the rates were lowered by $3,100,000.

Architect's drawing of the Southern California Gas Co.'s proposed four-story class "A" building to be erected next door to the company's present height-limit building. Scheduled for completion early next year, the new structure together with land and equipment will cost approximately $300,000.

Southern California Gas Co. Plans New $300,000 Building

SOUTHERN California Gas Co., Los Angeles, announced August 26 that a contract for the construction of a class "A" reinforced concrete building has just been awarded to the P. J. Walker Co. It is estimated that the total cost of the structure with land and equipment will be in excess of $300,000.

The new structure, to be located immediately south of the company's present height-limit headquarters at 810 South Flower street, will ultimately be six stories in height, it is planned. Four stories and basement will be built now and will cover an area 60 ft. along the street front by 150 ft. deep. Construction is scheduled to start August 26, and it is expected that the structure will be completed shortly after the first of the year.

The general architectural style of the new building, designed by Robert V. Derrah, Los Angeles architect, will be in the functionalized modern trend with large spaces given over to windows. Details of the construction will include the most modern gas air-conditioning equipment, and a special gas-fired heating system. Elevators of the latest type will be installed, and the walls will be treated with an acoustical material to reduce noise.

Most important objective of the new building is the enlargement of present facilities for service to the public. As one feature of the new structure, it is planned to provide the latest telephone contact facilities which will permit a customer to place an order or get information on a single statement of the case, rather than be switched from person to person.

■ ■

Construction Started On Texas Purification Plant

Capable of purifying 70,000,000 cu. ft. of gas per day, a gas purification plant is under construction at Borger, Texas.

Designed to reduce the hydrogen sulphide concentration of the gas ahead of gasoline absorption and carbon black plants, the plant is reported to be the first and largest of its kind.

Corrosion of the equipment of both the gasoline and carbon black plants will be reduced in the new gas purification process, it is stated.

FOR LOW COST GAS PURIFICATION

Connelly HAS WHAT IT TAKES

Connelly IRON SPONGE

CONNELLY U-GAUGES

CONNELLY BACK PRESSURE VALVE

Here's a complete purification service with an impressive record for improving efficiency and reducing operating costs in plants all over the country. Connelly engineers, in daily contact with gas purification problems of all types, are equipped to render a valuable service to you.

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Connelly U-Gauges or Manometers provide a sturdy, dependable instrument for portable or stationary use. Tubes are of unbreakable glass substitute, threaded to make pressure-proof joint without gaskets. Needle valves at top may be closed to retain fluid for portable use. Made with or without valves in a wide range of sizes. Specify whether mercury or water is to be used. The Connelly single column Mercury Gauge of special design meets a definite need in the gas industry.

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Connelly Back Pressure Valves are made in a wide range of styles and sizes to meet every requirement. Extremely sensitive, they provide a positive check against back pressure, yet exert minimum resistance to flow. Made so that flap may be removed for cleaning and inspection without removing valve from line.

BACKED BY 64 YEARS' EXPERIENCE

Connelly engineers have been serving the gas industry for more than 64 years and their unbiased recommendations have been responsible for remarkable savings in many well-known plants. Send us samples of your materials with details of your problems. We will gladly make an analysis and submit our findings without cost or obligation.

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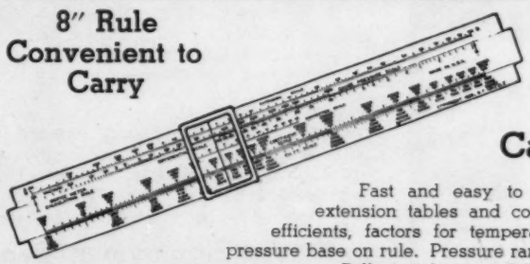

New Orifice Meter Calculating Rule

Fast and easy to operate. Eliminates using extension tables and coefficient tables. Orifice coefficients, factors for temperature, specific gravity and pressure base on rule. Pressure range 25" vacuum to 1000 lbs. gauge pressure. Differential range 0.5" to 100". Will figure gas rates from 100 cu. ft. per hour to 4 million cu. ft. per hour.

Indispensable to metermen and field men for quick calculation of orifice meter rates, also to figure sizes of plates necessary to measure different gas rates. Complete instructions with each rule. Natural wood finish.

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DEPENDABLE
***Automatic* GAS HEAT**
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GAS CONTROL PACKAGE SET

Includes:

SERIES A SOLENOID VALVE
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MODEL 200 THERMASTER
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BECAUSE...

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- **The name is known.** For 53 years CROWN has been the leader in the gas range field.
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Dealers everywhere are realizing quick sales and good profits because of the exceptional design features and superior construction of **Crown Ranges.**

You, too, should "line-up" with **Crown** for increased stove sales. Write for dealer proposition.

CROWN STOVE WORKS
4631 W. 12th PLACE, CHICAGO
Originators of
BUFFET and DIVIDED-TOP GAS and ELECTRIC RANGES

Modern heating and air-conditioning showroom of the Muller Furnace Sales Co., Portland, Ore. Owner A. L. Morris has adopted the latest slant in this type of selling by having several models in operation as well as showing usual display.

FPC Orders Rate Reduction On Gas In Chicago Area

THE Federal Power Commission, in a joint motion of the Illinois Commerce Commission and its own counsel, recently ordered a minimum of $3,750,000 per annum reduction in the wholesale rates for natural gas in Chicago and vicinity.

Officials said more than 92% of the gas sold by the Natural Gas Pipe Line Co., of America, Chicago, Ill., and the Texoma Natural Gas Co., is sold in Illinois and approximately 90% is sold to the Chicago (Ill.) District Pipe Line Co., which in turn sells to the Peoples Gas Light and Coke Co., Chicago, Ill., the Public Service Co. of Northern Illinois, Evanston, Ill., and the Western United Gas and Electric Co., Aurora, Ill.

The Illinois commission stated in its petition that the Peoples Gas Light and Coke Co. alone delivers gas service to more than 800,000 domestic and other users of gas in Chicago.

The commission also extended the time to September 1 for the filing of new schedules of rates and charges to the companies.

■ ■

Monthly Meeting of S.C.M.A. Held at Long Beach, Calif.

The Southern California Meter Association held its monthly meeting August 22 at the Robinson Hotel, Long Beach, Calif.

Telemetering was discussed by H. J. Keeling, Southern Counties Gas Co., Los Angeles, Calif., and Herbert Vogan, Pacific Coast manager A.G.A. Testing Laboratories, gave an address entitled "Function and Operation of the American Gas Association Testing Laboratories."

■ ■

Increased Employment Seen For Natural Gas Industry

Advancing technology in the natural gas and petroleum industries steadily has been increasing the output per man-hour in these industries, according to the U. S. Bureau of Labor Statistics, yet indications are that additional workers will be required.

Employment of skilled labor in most branches of these industries, the report finds, rapidly is displacing unskilled labor, the demand for which is fast disappearing. The trend is now toward trained technicians and skilled and semi-skilled workers, and away from the floating crew of roustabouts that formerly comprised the bulk of the industry's working force.

For the bulk of the industry's labor force, youths with high school education or its equivalent are preferred as new employes. Most of those accepted for employment, moreover, usually are put through an additional schedule of training at company expense.

■ ■

Johns-Manville Company To Support National Defense

Lewis H. Brown, president of Johns-Manville Corp., New York, N. Y., in a statement recently promised that all employes of the company who may be called by the government for a year's military training would be re-employed upon their return from training. He also explained the company would keep up premium payments on such life insurance and health and group accident insurance as the 10,000 employes may be carrying through the company at the time of the draft.

It is further stated that preference is given to American citizens in the selection of new employes in the United States and that supervisors will be loaned for vocational training where instructors may be required.

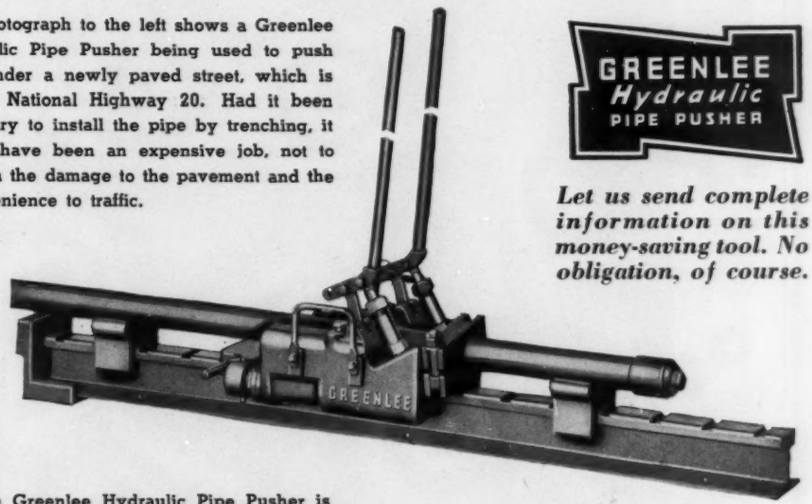
■ ■

Sprague Meter Company Opens Western Branch

The Sprague Meter Co. of Bridgeport, Conn., announces the opening of a new Los Angeles branch and warehouse at 2840 East 11th street, September 21. Erected to provide better service for the western states, local officers of the company are inviting inspection of the building which provides 15,000 sq. ft. of floor space, modern office facilities, new designs in proving room equipment and a railroad siding, according to E. H. Roseberry, vice president of the Sprague Meter Co., who is manager of the division.

Pipe Installed — Pavement Not Disturbed
AND TRAFFIC WENT ON AS USUAL

The photograph to the left shows a Greenlee Hydraulic Pipe Pusher being used to push pipe under a newly paved street, which is part of National Highway 20. Had it been necessary to install the pipe by trenching, it would have been an expensive job, not to mention the damage to the pavement and the inconvenience to traffic.



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Let us send complete information on this money-saving tool. No obligation, of course.

When a Greenlee Hydraulic Pipe Pusher is available, there need be no thought of tearing up streets or lawns. All that is necessary is a trench long enough to take the pusher with a section of pipe, and one man can stand in a comfortable position and send pipe where it is wanted, simply by pumping the levers.

Here is a tool that is easy to take to the job and simple to set up and operate. It has capacity for 4-inch or smaller pipe and will develop a pressure of 40,000 pounds against the pipe clamp. Since it operates on a notched steel base, the pipe clamp is reset only when the end of the base is reached.

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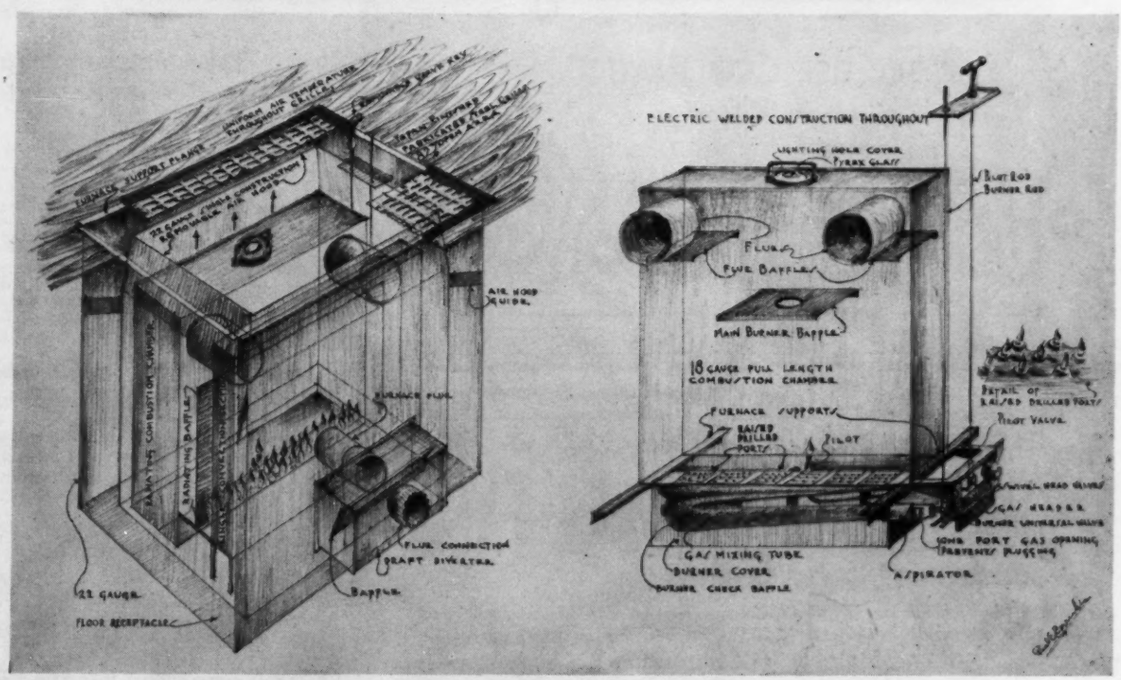

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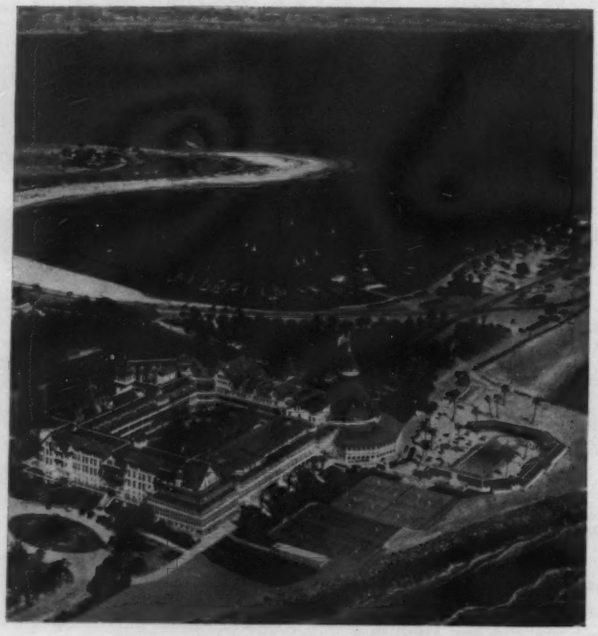

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FPC Authorizes Five Gas Companies To Export Gas

THE Federal Power Commission has recently authorized the United Gas Pipe Line Co., Houston, Texas, to export natural gas from the United States to the Republic of Mexico. The commission extended also temporary authorizations to United Gas Corp., Houston, Texas; El Paso (Texas) Natural Gas Co.; Texas Cities Gas Co., Dallas, Texas, and Texas Gas Utilities Co., Del Rio, Texas, to export natural gas from the states of Arizona and Texas to Mexico.

Another order of the commission extends the temporary authorization granted to Iroquois Gas Corp., Buffalo, N. Y., for the exportation of natural gas to the Province of Ontario, Canada.

The commission's orders extending temporary authorizations specify that they shall automatically terminate if prior to the extended dates the commission shall adopt a further order upon consideration of the full record in the matters involved.

■ ■

Skelly Oil Co. Converts Booster To Gasoline Plant

The Skelly Oil Co., Tulsa, Okla., is converting its old booster station south of Shidler, Okla., into a new gasoline plant.

When placed in operation, the former low pressure gas moving equipment will process 8,000,000 cu. ft. of 300-lb. gas from which it is estimated one gal. of gasoline will be extracted for each 1000 ft. of gas handled.

The new plant, according to J. W. Vaiden, manager, will push the raw gases to Lyman where the bulk of butane-propane solvents and natural gases are produced and then boosted onto the tender of the Great Lakes Pipe Co. for blending at Kansas City, Kansas.

The residue gas will be discharged into the South Burbank field to improve well pressures.

■ ■

John Zink Company Tours Southwest With Exhibit

The John Zink Co., Tulsa, Okla., is touring the Southwest as far north as Kansas City and as far east as Chattanooga, Tenn., with a traveling exhibit of heating boiler burners, commercial conversion burners and floor furnaces.

This exhibit takes to consumer and dealer a display of these types of burners, and a company sales engineer accompanies the exhibit as demonstrator.

■ ■

General Controls Company Moves Kansas City Office

The General Controls Co., Glendale, Calif., manufacturer of pressure, temperature and flow controls, announces a change in address of their Kansas City, Mo., office to 421 Southwest Boulevard.

Larger quarters at this new address will permit the company to carry larger stocks and increase the scope of service to customers in that territory, according to E. V. Bialik, sales engineer.

■ ■

Gas Generates Electric Power

Approximately 192,000,000,000 cu. ft. of natural gas were used as fuel for generating electric power during the year of 1939. This was an increase of more than 13% over the previous year.

Well Drilling Costs and Time Requirements Reduced

AN average oil well today is drilled five times as fast as it was 10 years ago, so rapid have been the improvements in drilling equipment and techniques, according to an American Petroleum Institute release.

Oil wells 6000 ft. deep now are being sunk in 12 days, or at the rate of 500 ft. a day. Only 10 years ago the average 3000-ft. well required 30 days to drill. Costs per foot, too, have been reduced as drilling methods improve. Ten years ago wells 3000 to 4000 ft. deep cost $8 a foot; today on the Gulf Coast wells 5000 to 6000 ft. deep are being completed at a cost averaging $3 to $4 a foot.

Improved equipment now makes it possible to drill at the rate of 50 ft. an hour, and bits at the end of the drill commonly last for 1000 ft. A decade ago the average drilling speed was 5 ft. an hour, and 75 ft. was an average footage per bit. Oil-well drillers used to spend a third of their drilling time in running the drill pipe in and out of the hole to change bits; now, they report, time lost this way averages only one-fifth of the total.

■ ■

Western Pennsylvania Is Scene of New Gas Fields

The Union Natural Gas Co., and White and Avery Mitchell, independent Texas gas producers, are conducting surveys in Crawford, Mercer, Lawrence and Trumbull counties, Western Pennsylvania. This is said to be the largest expansion program since 1929.

Geologists state that fields of natural gas recently opened in Crawford county have a potential daily capacity of 10,000,000 cu. ft.

■ ■

North Dakota Natural Gas To Be Developed Soon

According to news reports, the first step in the development of natural gas commercially in North Dakota was taken recently through the authorization of an oil and gas lease on 1280 acres of North Dakota school land near Marmarth to the Montana-Dakota Utilities Co., Minneapolis, Minn.

There is already one capped gas well in the newly leased area, it was stated.

■ ■

Porcelain Enamel Institute Studies Appliance Finishes

The Porcelain Enamel Institute, 612 North Michigan Ave., Chicago, Ill., has recently released a three-color booklet which summarizes the result of a six-city consumer survey of the condition of finishes on porcelain and synthetic enameled appliances after various periods of use. The survey which included 2362 kitchens indicated porcelain enamel finishes were the most satisfactory.

■ ■

Crosby Gas Co. May Sell

The Crosby Gas Co., Crosby, Pa., is seeking permission of the Public Utility Commission to sell its property and assets to the North Penn Gas Co. The purchase price is set at $72,000 and the North Penn Co. would take over service of the Crosby Gas Co.'s customers.

■ ■

Indianola Grants Franchise

The Aksarben Gas Co. was recently granted a 25-year franchise to lay pipe in Indianola, Neb. The franchise calls for $25 a year for the first year; $50 for the next 22.

"QUALITY" BUILT THIS PLANT

★ "PACIFIC" is one of the largest plants in the world engaged exclusively in the manufacture of gas heating appliances. In this plant, day and night, hundreds of sheet metal workers, foundrymen, machinists, finishers and expert laboratory technicians busily build for a waiting trade from coast to coast and abroad. For "Pacific" is synonomous with *Highest Quality* . . . gas heating appliances of utmost efficiency, long life, true money's worth. Widespread admiration for "Pacific" products, respect for the company's policy, and the resulting large and steadily increasing volume of business, reflect 27 years of constant, skilful and specialized determination to make always the *Best* gas heating equipment.

The "Pacific" Line is a Complete Line.

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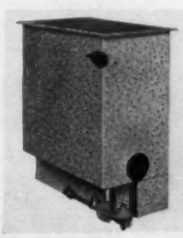

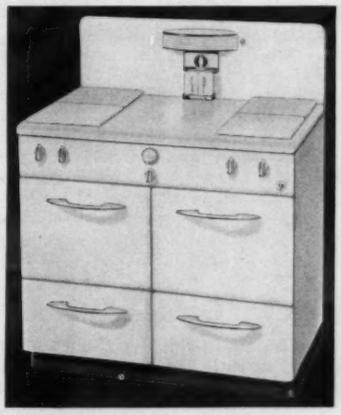

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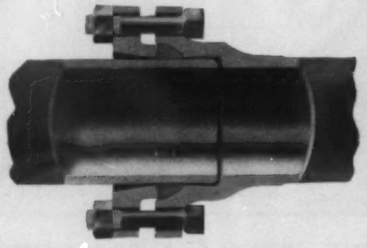
MONO-CAST DOUBLEX SIMPLEX PIPE

For the Oil and Gas Industry



PERMANENT pipe of exceptionally high strength, equipped with a flexible joint that is bottle-tight under gas or liquid pressure ranging into hundreds of pounds! Economical to buy and install! Costs least to maintain! Dependability proved by hundreds of installations operating under varying service conditions throughout the United States and in foreign countries! Those are the salient advantages which have won for Mono-Cast Doublex Simplex the confidence and esteem of oil and gas men everywhere. Let us assist you with your next oil or gas transmission or distribution pipe line problem.

AMERICAN CAST IRON PIPE CO.

BIRMINGHAM, ALA.

Dallas Houston El Paso Pittsburgh Kansas City Chicago Minneapolis New York City Cleveland Los Angeles San Francisco

This gas heater surrounding the gas main adjoining the reducng valve nullifies temperature drop due to expansion, permitting the operation of the unit in cold weather.

A Heater That Maintains Fuel Flow

GAS used in gas engines driving pumping units in the Rodessa (La. and Texas) field is distributed through high pressure mains, and reduced to the proper pressure at each power site.

During cold weather trouble was experienced at the regulator through the line "freezing up" and restricting or cutting off the flow of gas to the engine. One producer circumvented this difficulty by disconnecting the fuel line at the regulator and slipping over it a length of 6-in. pipe. The end farther from the regulator is closed with a disc, welded to the fuel line and the 6-in. pipe so as to hold the two concentric.

Into the open end of the 6-in. is set a burner on the end of a ¼-in. line cut into the high pressure main. By igniting this burner and warming the pipe before the main fuel valve is opened, the pipe is heated sufficiently to keep down the cooling effect of the expansion of the fuel through the regulator, and even flow is maintained.

Products of combustion from the heater are carried off through a short stack welded to the 6-in. over a corresponding aperture therein near the closed end.

FPC Denies Complaint Case Against Hope Natural Gas Co.

The Federal Power Commission has denied the city of Toledo's application to have its complaint case consolidated with the pending proceedings involving rates and charges for gas sold by the Hope Natural Gas Co., Clarksburg, W. Va., to distributing companies for resale.

The complaint alleges that the wholesale price of 30c per M c.f. for natural gas sold by the Hope Natural Gas Co. to the Northwestern Ohio Natural Gas Co., Columbus, Ohio, which sells gas at retail in Toledo, Ohio, is unlawful, excessive and unreasonable.

The commission finds that it would not be in the public interest to have the complaint case consolidated with the pending proceedings because the consequent delay would impede the completion of the present proceedings.

■ ■

Allentown Offices Altered

The Allentown-Bethlehem Gas Co., Allentown, Pa., recently completed alterations at the Catasauqua office. The front of the building has been changed, a doorway at the side making large window space available, the exterior painted grey and the interior fluorescent lighted, it is reported.

■ ■

Several Louisiana Towns Expect Gas Service

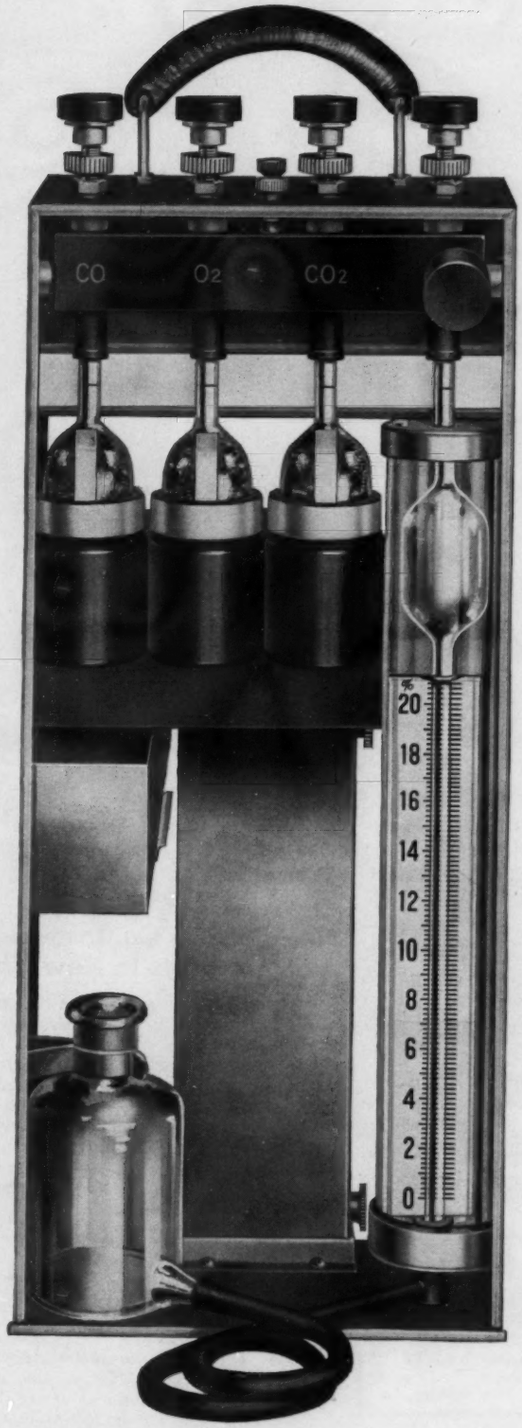
Iberia, La., recently granted a 25-year franchise to Jesse C. Barbour which promises to give natural gas to consumers within a year. The installation of gas mains through the parish by the Southern Union Utilities Co., Dallas, Texas, will be part of a system which the representative of the company states will supply gas to sections of Iberia, St. Mary, Terrebonne, Plaquemine, Assumption and Ascension parishes, and if plans are completed to West Baton Rouge parish.

■ ■

Gas For Estherville, Iowa

The Peoples Natural Gas Co., Omaha, Neb., will start service in Estherville, Iowa, about September 1, according to news reports. The company has been authorized to serve eight Iowa towns from the 241-mile line connecting Sioux City, Iowa, with Minneapolis, Minn. Offices have been recently set up in Estherville.

ELLISON GAS ANALYZER



A NEW DEPARTURE IN GAS ANALYZER DESIGN

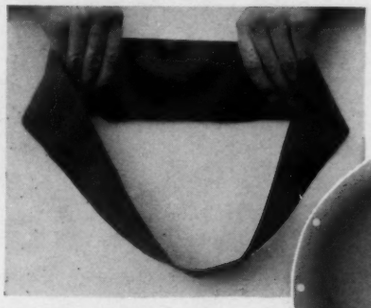
Monel case 4x4½x18," covers removed, with or without draft gage sets and thermometers. Header and seats of hard rubber. Needle valve stems of corrosion-proof alloy, swivel joint. Pipettes filled with curled hard rubber. White panels in pipettes and back of capillaries. White scale, 7 to 8" long, compensated for "dead volume"—no error. Solution containers interchangeable. Gas line ⅛"—high speed sampling. Air seal, U type, trouble-proof. Burette jacket filled with glycerine, Monel cap top and bottom. Automatic or hand zero leveling. Accurate, durable and speedy.

"A Very Superior Instrument"

ELLISON DRAFT GAGE CO. 214 W. Kinzie St. Chicago

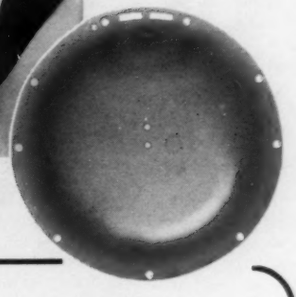
VULCAN

Gas Diaphragms



Seams in Vulcan Diaphragm Loops are vulcanized, not stitched. This eliminates a common cause of leaky diaphragms.

Below: Vulcan Diaphragm for Sprague No. I-A Meter.



Loops for tin case meters . . . Stitched seams eliminated.

Molded diaphragms for iron case meters and regulators . . . Flange leaks eliminated.

Excellent and permanent flexibility. No oiling required. Vulcan Diaphragms do not dry out or become hard.

Especially suitable for natural and petroleum gases.

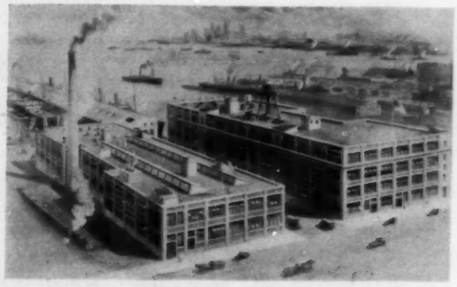
Unaffected by temperature changes.

Diaphragms available for all makes and sizes of meters and regulators . . . insuring accurate, uniform, positive operation at all times.

Write for more particulars to . . .

VULCAN
PROOFING COMPANY

First Avenue and Fifty-eighth St., Brooklyn, N. Y.



Plant of the Vulcan Proofing Company, Brooklyn, N. Y.

S.E.C. Approves Sale Plan of San Diego Consolidated Co.

THE Securities Exchange Commission approved, August 26, the plan for disposal by Standard Gas & Electric Co., Chicago, Ill., of control of the San Diego Consolidated Gas & Electric Co., San Diego, Calif., which is said to be the first such proposal for simplification of utility holding companies to receive S.E.C. sanction.

The S.E.C. issued an integration order against the Standard Gas & Electric Co., last March, and three months later the company proposed a program under which it would dispose of its control of west coast properties, involving $130,000,000 of assets, and confine the system to properties in the Minnesota-Wisconsin and Pittsburgh areas.

Standard Gas owns 99.07% of San Diego Consolidated's outstanding stock, it is stated, and the San Diego company has about $44,000,000 of assets.

■ ■

Alabama Gas Company Remodels Selma Office

R. A. Puryear, Jr., local manager, Alabama Gas Co., announced the remodeling of the Selma, Ala., office recently, in connection with the Southern Gas Association's "Clean Up — Paint Up" program. According to reports, the new "Hospitality Room" is the outstanding distinction. Other features are a new front, redesigned show floor and office space, and a demonstration kitchen in the basement equipped for use by clubs and private parties as well as cooking schools and demonstrations.

QUICK, easy installation, years of trouble-free, load-building operation, greater customer satisfaction are assured when you sell Fraser equipment . . . a type and size for every heating need.

SCIENTIFIC engineering plus many exclusive features, the finest materials and eye-appealing modern design make your sales job easier. Recently doubled floor capacity assures prompt shipment.

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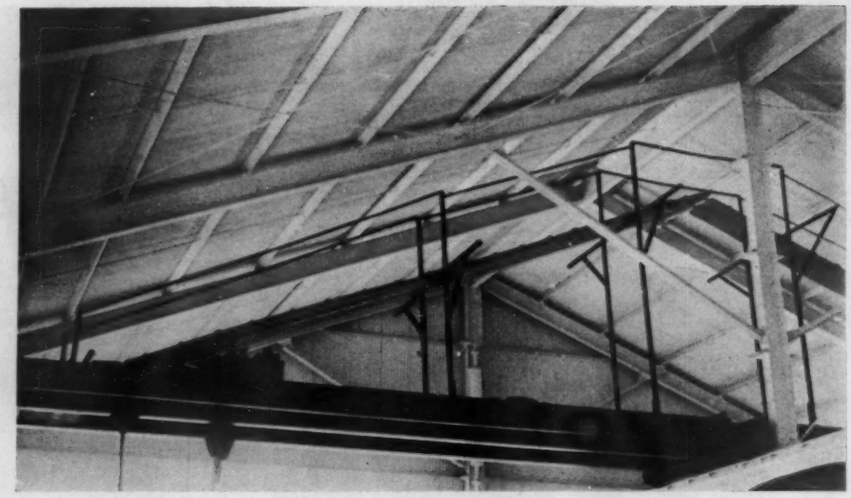
GAS HEATING EQUIPMENT



Platform for scraping and painting compressor station ceiling.

United Gas Pipe Line Employes Devise Protective Scaffold for Moving Crane

THE Magasco compressor station employes of the United Gas Pipe Line Co., of Houston, Texas, have greatly reduced the hazards of repainting, cleaning and scraping high ceilings by devising a scaffold frame on a movable crane which lessens the chances of workmen falling.

The runway of the scaffold is built on the same angle as the slant of the roof and just far enough below the roof to allow men to work easily. The frame is made of pipe and the runway of 2-in. boards, cleated with strips to prevent slipping. Pipe railings enclose both sides. By moving the crane carrier as desired, the entire ceiling can be treated from this platform.

■ ■

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Gas Service Co. Installs Heating Units In New Church

Harold McGrath, manager of The Gas Service Co., at Ottawa, Kan., recently secured contracts for three Security Forced Air Furnaces to be installed in a new Catholic church which will be built at Ottawa to replace the former one destroyed by fire.

Mr. McGrath also announces that Baker University at Baldwin has purchased from the company two large unit heaters which will be used for the heating of the university's new community hall.

■ ■

Jackson Center Gas Co. Sold To Settle Estate

John Wolfe and Mrs. Bernice Gross have recently purchased the Jackson Center Gas Co., Jackson Center, Ohio. The sale was made necessary to settle an estate.

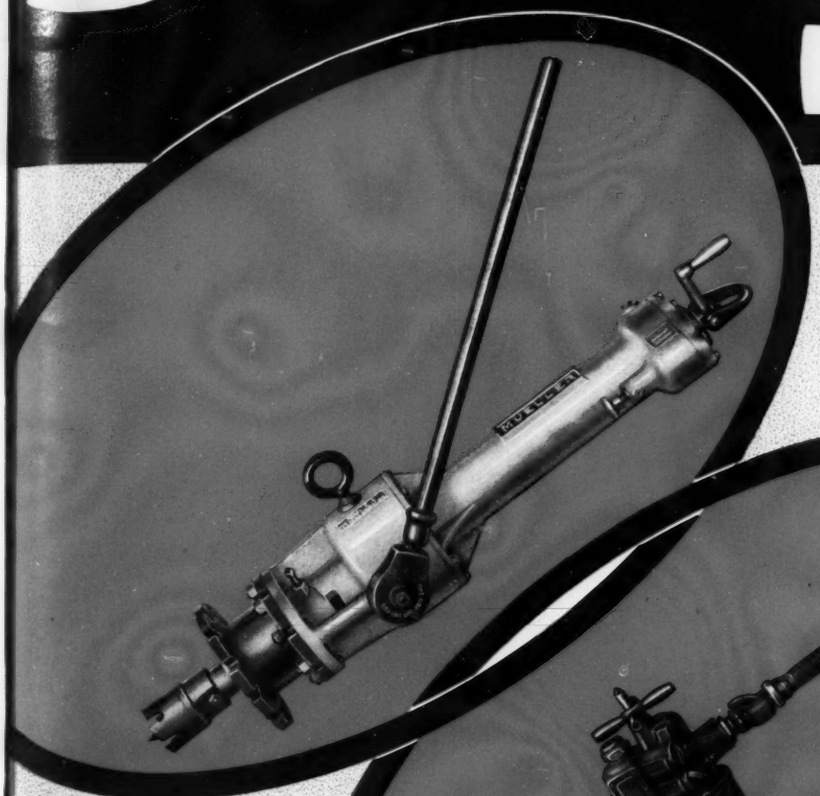
The first gas well drilled in that vicinity was on the farm of James Hoover in 1893, and produced only enough for his private needs. It was not until later that a number of wells were drilled and a franchise secured from the town.

■ ■

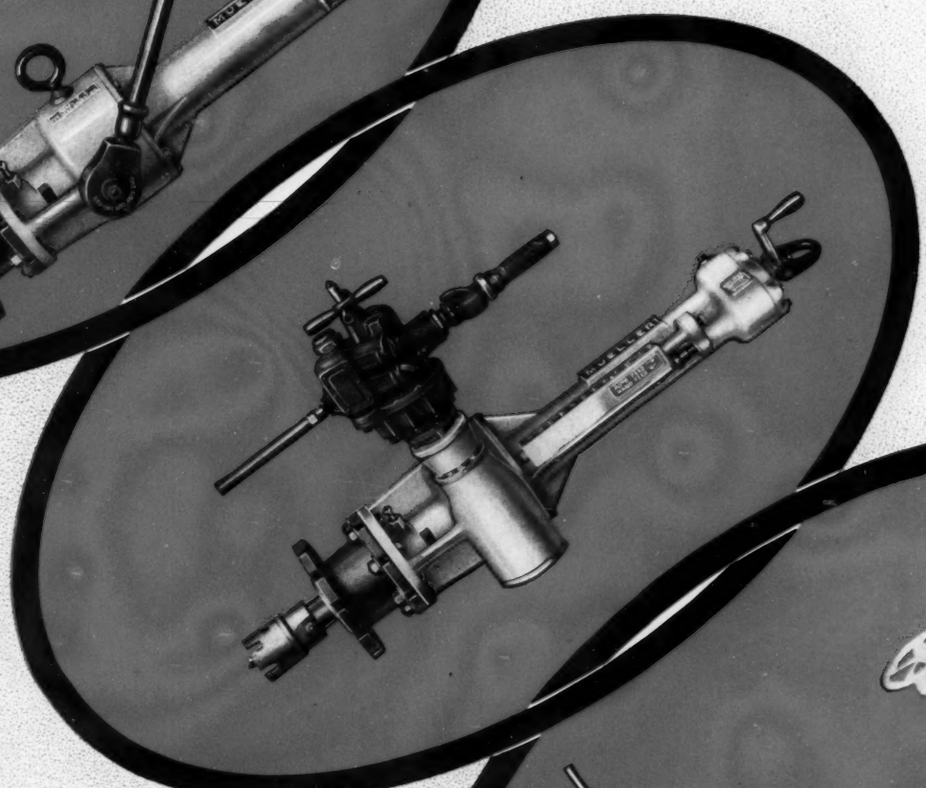
Lincoln, Neb., Issues New 10-Year Franchise

A new 10-year natural gas franchise was recently granted by Lincoln, Neb., to the Iowa-Nebraska Light and Power Co., Lincoln, Neb., which is identical with that approved 10 years ago except as to rates. These are reduced 5% on usage up to 10,000 cu. ft. per month, remaining the same above that figure. The revised rate structure was to be in effect September 1.

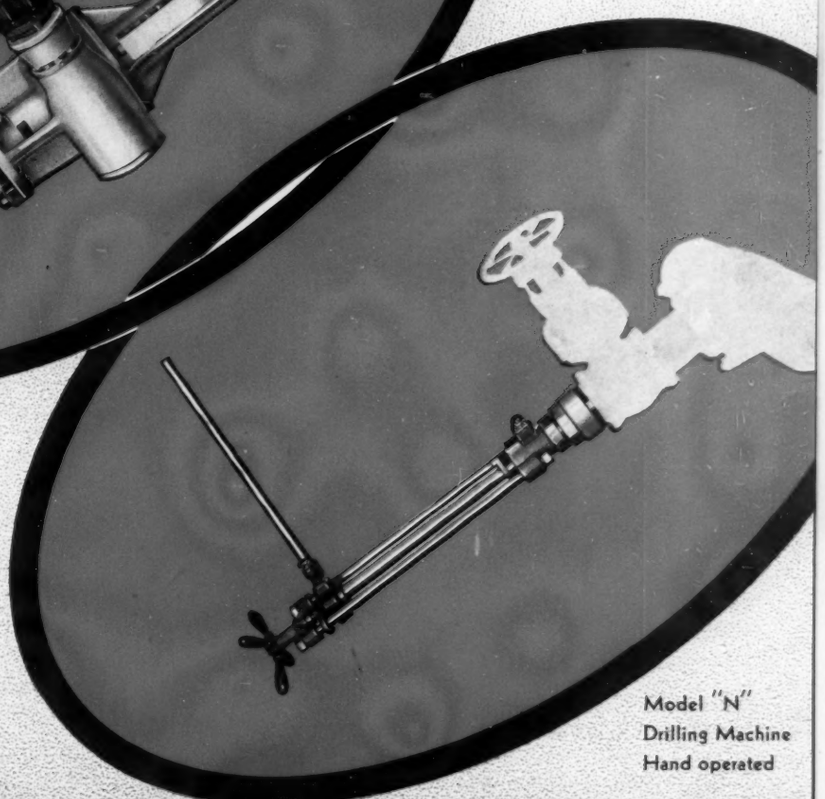
3 ANSWERS TO YOUR DRILLING PROBLEMS



Model "C-C"
Drilling Machine
Hand operated



Model "C-1"
Drilling Machine
Power operated



Model "N"
Drilling Machine
Hand operated

The line of Mueller Drilling Machines is the answer to many drilling problems. These machines will drill through Regular Gate Valves, Tapping Sleeves and Valves, Regular Fittings or Mueller Pressure Control Fittings when making branch or service connections in dry, low or high pressure mains.

The "C-C" and the "C-1" Machines will make cuts from 2" to 12" in any size main. They are furnished with either 25" or 36" travel—providing ample travel for drilling through Regular Gate Valves. The "N" Drilling Machine will drill through Gate Valves or Fittings from 2" to 4" inclusive for working pressures up to 500 lbs. per square inch.

Write us for complete information.

Mueller Co. Decatur, Illinois

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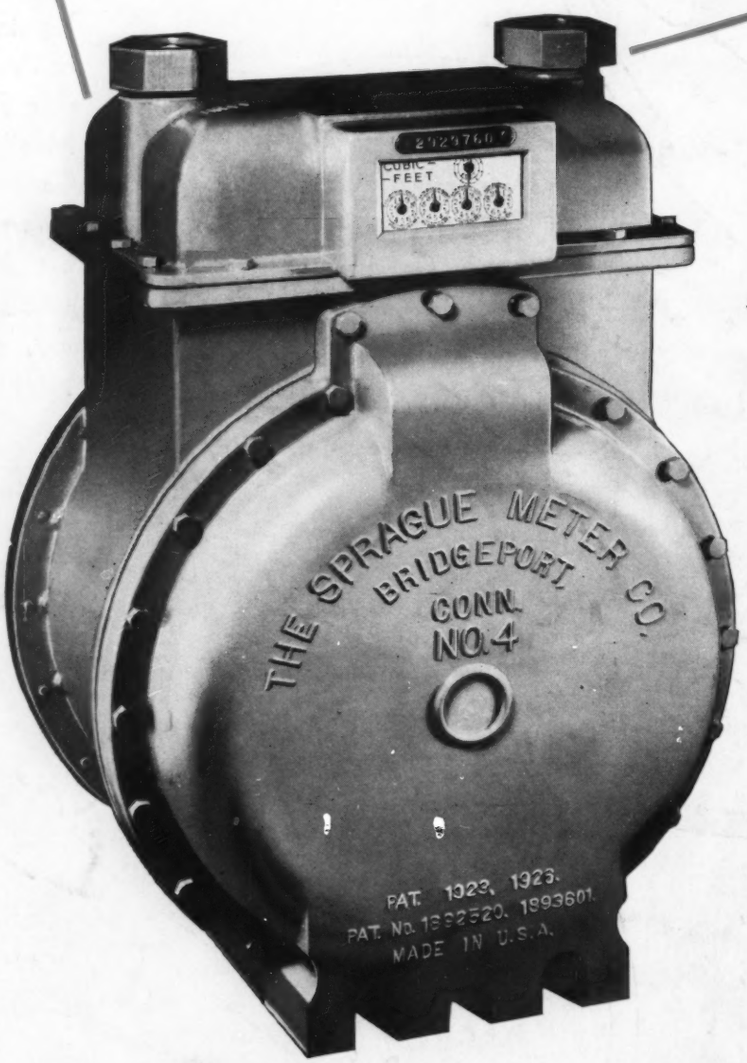
NOW IS THE TIME . . .

TO PREPARE FOR YOUR FALL HOUSEHEATING REQUIREMENTS!



SPRAGUE No. 4 Meters

MEET THOSE REQUIREMENTS

CAPACITY:

600 cu. ft. ½"

1350 cu. ft. 2"

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